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PROCEEDINGS
OF THE
Society of Antiquaries of Scotland





PROCEEDINGS

OF THE

Society of Antiquaries of Scotland

SESSION

MCMXXXIII.-MCMXXXIV.



26689



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VOL. LXVIII.

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L A W S
AND
LIST OF FELLOWS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND



L A W S

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND.

INSTITUTED NOVEMBER 1780 AND INCORPORATED BY
ROYAL CHARTER 6TH MAY 1783.

(Revised and adopted November 30, 1901.)

1. The purpose of the Society shall be the promotion of ARCHÆOLOGY, especially as connected with the investigation of the ANTIQUITIES AND HISTORY OF SCOTLAND.

2. The Society shall consist of Fellows, Honorary Fellows, Corresponding Members, and Lady Associates.

3. Candidates for admission as Fellows must sign the Form of Application prescribed by the Council, and must be proposed by a Fellow and seconded by two members of the Council. Admission shall be by ballot.

4. The Secretaries shall cause the names of the Candidates and of their Proposers to be inserted in the billet calling the Meeting at which they are to be balloted for. The Ballot may be taken for all the Candidates named in the billet at once; but if three or more black balls appear, the Chairman of the Meeting shall cause the Candidates to be balloted for singly. Any Candidate receiving less than two-thirds of the votes given shall not be admitted.

5. Honorary Fellows shall consist of persons eminent in Archaeology, who must be recommended by the Council, and balloted for in the same way as Fellows; and they shall not be liable for any fees of admission or annual subscriptions. The number of Honorary Fellows shall not exceed twenty-five.

6. Corresponding Members must be recommended by the Council and balloted for in the same way as Fellows, and they shall not be liable for any fees of admission or annual subscriptions.

7. Ladies who have done valuable work in the field of Archaeology may be admitted as Lady Associates. The number of Lady Associates shall not exceed twenty-five. They shall be proposed by the Council and balloted for in the same way as Fellows, and shall not be liable for any fees of admission or annual subscriptions.

8. Before the name of any person is added to the List of Fellows, such person shall pay to the funds of the Society Two Guineas as an entrance fee and One Guinea for the current year's subscription, or may compound for the entrance fee and all annual subscriptions by the payment of Twenty Guineas at the time of admission. Fellows may compound for future annual subscriptions by a single payment of Fifteen Guineas after having paid five annual subscriptions; or of Ten Guineas after having paid ten annual subscriptions.

9. The subscription of One Guinea shall become due on the 30th November in each year for the year then commencing; and if any Fellow who has not compounded shall fail to pay the subscription for three successive years, due application having been made for payment, the Treasurer shall report the same to the Council, by whose authority the name of the defaulter may be erased from the list of Fellows.

10. Every Fellow not being in arrears of the annual subscription shall be entitled to receive the printed Proceedings of the Society from the date of election.

11. None but Fellows shall vote or hold any office in the Society.

12. Subject to the Laws and to the control of the Society in General Meetings, the affairs of the Society shall be managed by a Council elected and appointed as hereinafter set forth. Five Members of the Council shall be a quorum.

13. The Office-Bearers of the Society shall consist of a President, three Vice-Presidents, two Secretaries for general purposes, two Secretaries for Foreign Correspondence, a Treasurer, two Curators of the Museum, a Curator of Coins, and a Librarian. The President shall be elected for a period of five years, and the Vice-Presidents for a period of three years.

One of the Vice-Presidents shall retire annually by rotation and shall not again be eligible for the same office until after the lapse of one year. All the other Office-Bearers shall be elected for one year and shall be eligible for re-election.

14. In accordance with the agreement subsisting between the Society and the Government, the Board of Manufactures (now the Board of Trustees) shall be represented on the Council by two of its Members (being Fellows of the Society) elected annually by the Society. The Treasury shall be represented on the Council by the King's and Lord Treasurer's Remembrancer (being a Fellow of the Society).

15. The Council shall consist of the Office-Bearers, the three representative Members above specified, and nine Fellows, elected by the Society.

16. Three of the nine elected Members of Council shall retire annually by rotation, and shall not again be eligible till after the lapse of one year. Vacancies among the elected Members of Council and Office-Bearers occurring by completion of term of office, by retirement on rotation, by resignation, by death or otherwise, shall be filled by election at the Annual General Meeting. The election shall be by Ballot, upon a list issued by the Council for that purpose to the Fellows at least fourteen days before the Meeting.

17. The Council may appoint committees or individuals to take charge of particular departments of the Society's business.

18. The Annual General Meeting of the Society shall take place on St Andrew's Day, the 30th of November, or on the following day if the 30th be a Sunday.

19. The Council shall have power to call Extraordinary General Meetings when they see cause.

20. The Ordinary Meetings of the Society shall be held on the second Monday of each month, from December to May inclusive.

21. Every proposal for altering the Laws must be made through the Council; and the Secretaries, on instructions from the Council, shall cause intimation thereof to be made to all the Fellows at least one month before the General Meeting at which it is to be determined on.

FORMS OF BEQUEST.

Form of Special Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, my collection of and I direct that the same shall be delivered to the said Society on the receipt of the Secretary or Treasurer thereof.

General Form of Bequest.

I, A. B., do hereby leave and bequeath to the Society of Antiquaries of Scotland incorporated by Royal Charter, the sum of £ sterling [*to be used for the general purposes of the Society*] [*or, to be used for the special purpose or object, of*], and I direct that the said sum may be paid to the said Society on the receipt of the Treasurer for the time being.

LIST OF THE FELLOWS

OF THE

SOCIETY OF ANTIQUARIES OF SCOTLAND,

NOVEMBER 30, 1934.

PATRON :
HIS MAJESTY THE KING.

- | | |
|--|---|
| 1932.*ADAM, DAVID RANKINE, 7B Stewarton Drive, Cambuslang. | 1920. ANDERSON, Rev. ROBERT S. G., B.D., The Manse, Castle Kennedy, Wigtownshire. |
| 1931. ADESW, Rev. HUGH M., M.A., Minister of St George's Presbyterian Church, 20 St James Road, East London, South Africa. | 1923. ANDREWS, MICHAEL CORRET, M.H.I.A., F.H.G.S., F.H.S.G.S., F.H.S.A.I., Orsett, Derryvolgie Avenue, Belfast. |
| 1917. ADESW, STAIR CARNEUK, M.A., LL.B., Barrister-at-Law, 60 Elm Park Gardens, London, S.W. 10. | 1913. ANGUS, Miss MARY, Inverloch, 354 Blackness Road, Dundee. |
| 1892. AUSA, The Most Hon. The Marquess of, Culzean Castle, Maybole. | 1921. ANGUS, WILLIAM, Curator of the Historical Department, Record Office, H.M. General Register House, Edinburgh, 2. |
| 1932. AINSWORTH, RICHARD, Author and Lecturer, Longmead, 51 Lauderdale Avenue, Cleveleys, near Blackpool. | 1926. ANGUS-BUTTERWORTH, L. M., F.H.G.S., F.Z.S., Lea Hurst, Dunham-Massey, Cheshire. |
| 1929. ALEXANDER, W. M., Journalist, Hillview Road, Cults, Aberdeenshire. | 1910. ANNAN, J. CRAIG, Glenbank, Lenzie. |
| 1930. ALLAN, Mrs H. M., 10 Anshe Place, Edinburgh, 3. | 1897. AMSTRUTHER-GRAY, WILLIAM, Lieut.-Col., Royal Horse Guards, Kilmany, Fife. |
| 1926. ALLAN, WILLIAM, M.B.E., 46 Croft Road, Cambuslang. | 1931. ANDRICK, WILLIAM F., M.A. (Edin. & Oxon.), H.M.I.S., 1 Murrayfield Gardens, Edinburgh, 12. |
| 1929. ANDERSON, WILFRED LORRAINE, Three-Corner Mead, Dutton Green, Kent. | 1931. ANDERSON, GILBERT, St Ola, Park Road, Leith, Edinburgh, 6. |
| 1925. ANDERSON ALEXANDER HUTTON, M.A., Donaldson's Hospital, Edinburgh, 12. | 1918.* ANDYLL, His Grace The Duke of, Inveraray Castle. |
| 1922.* ANDERSON, ARTHUR R., 6 Bowmont Terrace, Glasgow, W. 2. | 1910. ARMSTRONG, A. LESLIE, M.C., F.S.I., F.S.A., 27 Victoria Road, Stockton Heath, Warrington. |
| 1922. ANDERSON, ERIC S., 5 Eldon Street, Edinburgh, 4. | 1921. ARNOTT, JAMES ALEXANDER, F.R.I.B.A., 13 Young Street, Edinburgh, 2. |
| 1897. ANDERSON, Major JOHN HAMILTON, 2nd East Lancashire Regiment, c/o Messrs Cox & Co., 10 Charing Cross, London, S.W. 1. | 1910. ASHEN, JOHN, 13 Pitcullen Crescent, Perth. |
| 1902.* ANDERSON, Major ROBERT DOUGLAS, c/o The Manager, Lloyd's Bank, Farnham, Devon. | 1921. ASHWORTH, Mrs, Hillbank, Grange Loan, Edinburgh, 10. |
| | 1931. ASKEW, GILBERT H., Casula, Corbridge-on-Tyne, Northumberland. |

An asterisk (*) denotes Life Members who have compounded for their Annual Contributions.

- 1917.*ATHOLL, His Grace The Duke of, K.T., C.B., M.V.O., D.S.O., LL.D., Blair Castle, Blair Atholl.
1915. BAILEY DE LATOUP, The Countess Vincent, The Beehive, Fighnish, Dunvegan, Skye.
1932. BAILEY, JAMES M'KENZIE, 17 Alpin Road, Dundee.
1933. BAIN, F. W., M.C., 20 Palace Court, London, W. 2.
1922. BAIN, Rev. JOHN, Minister of St Paul's Church, 13 Dryden Place, Newington, Edinburgh, 9.
1920. BAIRD, Rev. ANDREW, B.D., J.P., Minister of the united parish of Broughton, Kilbucko, and Glenholm, The Manse, Broughton, Peebles-shire.
1925. BAIRD, JAMES, 81 Meadowpark Street, Dennistoun, Glasgow, E. 1.
1922. BAIRD, WILLIAM MACDONALD, F.F.S., 7 St Colme Street, Edinburgh, 3.
1923. BALFOUR, Miss, Whitthelghame, Haddington East Lothian.
1918. BALFOUR, Lieut.-Col. FREDERICK ROBERT STEPHEN, M.A., D.L., Dawyck, Stobo, Tweeddale.
1933. BALFOUR, The Hon. JAMES MUNCHEIFF, O.B.E., 41 Gloucester Square, London, W. 2.
1926. BALFOUR-MELVILLE, EVAN W. M., M.A., Lecturer in History in the University of Edinburgh, 2 South Leamonth Gardens, Edinburgh, 4.
- 1915.*BALLANTINE, JAMES, 24 Hill Street, Edinburgh, 2.
1933. BALLINGALL, GEORGE W., Dalgynch, 20 Midmar Gardens, Edinburgh, 10.
1921. BANERJEA, RASHNADI, M.B., F.I.A.Sc., Post Box, No. 10805, Calcutta, India.
1920. BANNERMAN, JOHN, St Margaret's, Elgin.
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- 1924.*YOUNGER, HARRY J., 21 Douglas Crescent, Edinburgh, 12.
1929. YOUNGER, Mrs J. P., Arnsbrae, Cambus, Clackmannanshire.
- 1912.*YOUNG, THOMAS, W.S., 10 East Clarendon Street, Edinburgh, 7.

SUBSCRIBING LIBRARIES, ETC.

American Philosophical Society.	National Museum of Wales, Cardiff.
Ashmolean Museum, Oxford.	New York Public Library, New York.
Birmingham Public Libraries - Reference Library.	Pennsylvania Historical Society, Philadelphia, U.S.A.
Chicago University Library, Chicago, U.S.A.	Public Library, Aberdeen.
Cleveland Public Library, Ohio, U.S.A.	Public Library, Dundee.
*Columbia University.	Public Library of Victoria, Melbourne, Australia.
Department of British and Medieval Antiquities, British Museum.	Reform Club, Pall Mall, London, S.W. 1.
Detroit Public Library, Detroit, U.S.A.	State Historical Society of Wisconsin, Madison, Wisconsin, U.S.A.
Dr Hay Fleming Library, The University, St Andrews.	*Stornoway Public Library, Island of Lewis.
*Faculty of Procurators' Library, Glasgow.	University College, Dublin.
Falkirk Archaeological and Natural History Society.	University Library, Leeds.
Free Public Library, Boston, Massachusetts, U.S.A.	University of Michigan, Ann Arbor.
Harvard College, U.S.A.	University of Minnesota, U.S.A.
Henry E. Huntington Library and Art Gallery, San Marino, California, U.S.A.	University of Pennsylvania, Philadelphia, Pa., U.S.A.
Institute of Accountants and Actuaries in Glasgow.	Victoria University of Manchester.
John Rylands Library, Manchester.	Yale University Library, New Haven, Connecticut, U.S.A.

LIST OF THE CORRESPONDING MEMBERS OF THE SOCIETY OF ANTIQUARIES OF SCOTLAND.

NOVEMBER 30, 1934.

- | | |
|---|--|
| 1923. BLACK, GEORGE F., Ph.D., New York Public Library, New York City, U.S.A. | 1915. MATHIESON, JOHN, F.R.S.E., 42 East Claremont Street, Edinburgh, 7. |
| 1927. BRENNER, SIMON, Mid Town, Preswick, Cathness. | 1915. MORRISON, MURDO, Lakefield, Bragar, Lewis. |
| 1928. FORTUNE, JOHN ROBERT, Airhouse, Oulton, Berwickshire. | 1924. MUIR, WILLIAM T., Brenda, Evie, Orkney. |
| 1913. FRASER, JOHN, 7 East Hermitage Place, Leith, Edinburgh, 6. | 1931. SMITH, SAMUEL, Mumrill, Laurieston, near Falkirk. |
| 1913. LEVY, Mrs S. (no address). | 1921. URRHANT, ANDREW, M.A., J.P. (no address). |
| 1933. MANN, ALEXANDER, 22 Boyd Street, Laurieston, Falkirk. | 1933. VORSTON, JAMES, Hutton, Rousay, Orkney. |

LIST OF HONORARY FELLOWS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND,
NOVEMBER 30, 1934

*[According to the *Laws*, the number is limited to TWENTY-FIVE.]*

1897.

Sir W. M. FLINDERS PETRIE, D.C.L., LL.D., F.B.A., F.R.S., Edwards Professor of Egyptology
in University College, London, W.C. 1.

1908.

Sir ARTHUR JOHN EVANS, M.A., D.C.L., Youlbury, near Oxford.
Professor H. DRAGENDORFF, Freiburg i. Baden, Johan von Weirthstrasse 4.

1919.

5 LÉON COUTIL, Correspondant du Ministère de l'Instruction Publique, etc., etc., Les Andelys,
Eure, France.
René CAGNAT, Secrétaire Perpétuel de l'Académie des Inscriptions et Belles Lettres, Professeur
au Collège de France, Palais de l'Institut (3 rue Mazarine), Paris.

1923.

M. l'Abbé H. BREUIL, D.L.C., Professeur au Collège de France et à l'Institut de Paléontologie
Humaine, Paris, 52 Avenue de la Motte Piquet, Paris, XV^e.
Professor FRANZ CUMONT, 19 Corso d'Italia, Rome.
G. F. HILL, C.B., M.A., LL.D., F.B.A., Litt.D., F.S.A., Director of the British Museum, London,
W.C. 1.

- 10 FRANK GERALD SIMPSON, M.A., 45 Fern Avenue, Jesmond, Newcastle-upon-Tyne.
 Mrs ARTHUR STRONG, C.B.E., Litt.D., LL.D., F.S.A., Life-Fellow of Girton College, Cambridge, and
 Assistant Director of the British School at Rome, 35 Via Balbo, Rome (22).
 A. M. TALLQVIST, Professor Universitetet, Helsingfors, Finland.

1926.

- MARCELLIN BOULE, Professor in the Muséum National d'Histoire Naturelle, and Director of the
 Institut de Paléontologie Humaine, 1 rue René Panhard, boulevard Saint-Marcel, Paris (13).
 Professor Dr philos A. W. BRØGGER, Bestyrer av Universitetets Oldsaksamling, Tullinløkken, Oslo,
 Norway.
 17 O. M. DALTON, M.A., F.B.A., 12 Sydney Place, Bath.
 Professor Dr ERNST FABRICIUS, Gehelmer Rat, Goethestrasse 44, Freiburg im Breisgau, Germany.
 Sir ARTHUR KEITH, M.D., D.Sc., LL.D., F.R.C.S. (Eng.), F.R.S., Conservator of the Museum and
 Hunterian Professor, Royal College of Surgeons of England; Past-President of the Royal
 Anthropological Institute of Great Britain and Ireland, and of the Anatomical Society.
 Master of the Buckton Browne Farm, Downe, Farnborough, Kent.
 Dr R. PARINENI, Director of the Institute of Archaeology of Rome, Museo Nazionale Romano, Rome.

1927.

- DON HERMILIO ALCALDE DEL RIO, Torrelavega, Santander, Spain.

1931.

- 20 Mrs M. E. CENNINGTON, 33 Long Street, Devizes, Wiltshire.
 Professor Dr ROBERT ZAHN, Director bei den Staatlichen Museen, Honorar-professor an der
 Universität, Am Lustgarten, Berlin, C.R.

1937.

- Professor Dr phil. HAARON SHETELIO, Bergens Museum Oldsamlng, Bergen, Norway.

LIST OF THE LADY ASSOCIATES
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND,
NOVEMBER 30, 1934.

[According to the Laws, the number is limited to TWENTY FIVE.]

1930.

Miss M. A. MURRAY, Edwards Library, University College, London, W.C. 1.
2 Mrs E. S. ARMITAGE, M.A., Parkhurst, Middlesbrough.

SOCIETIES, INSTITUTIONS, &c., EXCHANGING PUBLICATIONS.

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| <p>Architectural, Archaeological, and Historic Society
of Chester and North Wales.
Belfast Natural History and Philosophical Society.
Berwickshire Naturalists' Club.
Bristol and Gloucestershire Archaeological Society.
Buchan Field Club.
Buteshire Natural History Society.
Cambrian Archaeological Association.
Cambridge Antiquarian Society.
Carmarthenshire Antiquarian Society.
Courtauld Institute of Art.
Cumberland and Westmorland Antiquarian and
Archæological Society.
Derbyshire Archaeological and Natural History
Association.
Dumfriesshire Natural History and Antiquarian
Society.
Edinburgh Architectural Association.
Edinburgh Geological Society.
Elgin Literary and Scientific Society.
Essex Archaeological Society.
Gaelic Society of Inverness.
Glasgow Archaeological Society.
Hampshire Field Club and Archaeological Society.
Hawick Archaeological Society.
Historic Society of Lancashire and Cheshire.
Institute of Archaeology, Liverpool.
Kent Archaeological Society.
Orkney Antiquarian Society, Kirkwall.
Perthshire Society of Natural Science.
Royal Anthropological Institute.
Royal Archaeological Institute of Great Britain
and Ireland.
Royal Commission on Ancient and Historical
Monuments of Scotland.
Royal Commission on the Ancient and Historical
Monuments and Constructions in Wales and
Monmouthshire.
Royal Historical Society.</p> | <p>Royal Institute of British Architects, London.
Royal Irish Academy.
Royal Numismatic Society.
Royal Society of Antiquaries of Ireland.
Scottish Ecclesiastical Society.
Shropshire Archaeological Society.
Society for the Promotion of Roman Studies.
Society of Antiquaries of London.
Society of Antiquaries of Newcastle-upon-Tyne.
Somersetshire Archaeological and Natural History
Society.
Stirling Natural History and Archaeological Society.
Surrey Archaeological Society.
Sussex Archaeological Society.
Third Spalding Club.
Thornaby Society.
Viking Society for Northern Research.
Wiltshire Archaeological Society.
Yorkshire Archaeological Society.</p> |
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| <p>Archæological Survey of India.
British School at Rome.
Colombo Museum, Ceylon.
Provincial Museum, Toronto, Canada.
Royal Canadian Institute, Toronto.
University Museum, Dunedin, New Zealand.</p> | <p style="text-align: center;">FOREIGN SOCIETIES, UNIVERSITIES,
MUSEUMS, &c.</p> <p>Académie des Inscriptions et Belles Lettres, Paris.
Académie des Sciences d'Ukraine, Kieff.
Administration des Monuments, Riga, Lettonie.
Alterthumsgesellschaft, Königsberg.
Anthropologische Gesellschaft, Vienna.
Antiquarische Gesellschaft, Zürich.</p> |
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- Archaeological Institute of the Imperial University of Kyoto, Japan.
- Archäologisches Institut des Deutschen Reiches
Römisch-Germanische Kommission, Frankfurt am Main.
- Associació Catalana d'Antropologia, Etnologia i Prehistòria, Barcelona Universitat, Spain.
- Boanisch-Herzegovinisches Landes-Museum, Sarajevo.
- Bureau of Ethnology, Washington.
California University.
- Commissione Archeologica Comunale di Roma.
- Cornell University Library, Ithaca, New York.
- Čal. státní archaologický ústav (Institut archéologique de l'Etat tchécoslovaque) Praha, République tchécoslovaque.
- Department of Antiquities in Palestine, Jerusalem.
- Ecole d'Anthropologie de Paris.
- Faculté des Sciences de Lyon.
- Field Museum of Natural History, Chicago.
- Föreningen til Norske Fortidsminnesmerkers Bevarelse.
- Gesellschaft für Nützliche Forschungen, Trier.
- Göteborg och Bohusläns Fornminnesföreningen.
- Göttingen University.
- Historische und Antiquarische Gesellschaft, Basel.
- Historischer Verein für Niedersachsen.
- Institut Archéologique Bulgare, Sofia.
- Institut de Paléontologie Humaine, Paris.
- Junta Para Ampliación de Estudios—Comisión de Investigaciones Paleontológicas y Prehistóricas, Madrid.
- Junta Superior de Excavaciones y Antigüedades, Madrid.
- Kiel University.
- Kongelige Norske Videnskaber Selskab, Trondhjem.
- Landesmuseum Nassauischer Altertümer zu Wiesbaden.
- Leipzig University.
- Musée Archéologique Erasie Majewski de la Société des Sciences de Varsovie, Poland.
- Musée Guimet, Paris.
- Musée National Suisse à Zurich.
- Museum, Bergen, Norway.
- Museum of Northern Antiquities, Oslo.
- National Bohemian Museum, Prague, Czechoslovakia.
- National Museum, Zagreb, Yugoslavia.
- Nordiska Museet, Stockholm.
- Norsk Folkemuseum, Oslo, Norway.
- Notgemeinschaft der Deutschen Wissenschaft, Berlin.
- Oslo University, Norway.
- Pearson Museum, Cambridge, Mass., U.S.A.
- Prähistorische Kommission der Akademie der Wissenschaften in Wien.
- Reale Accademia Nazionale dei Lincei, Rome.
- Rijks-Museum van Oudheden, Leiden.
- Römisch-Germanisches Central-Museum, Mainz, Germany.
- Royal Academy of History and Antiquities, Stockholm.
- Royal Society of Northern Antiquaries, Copenhagen.
- Servicio de Investigación Prehistórica de la Excma. Diputación Provincial de Valencia.
- Smithsonian Institution, Washington, U.S.A.
- Societa Romana di Antropologia, Rome.
- Société d'Anthropologie de Paris.
- Société des Antiquaires de l'Ouest.
- Société Archéologique d'Alexandrie.
- Société Archéologique de Constantine, Alger a.
- Société Archéologique du Midi de la France.
- Société Archéologique de Montpellier.
- Société Archéologique de Moravie.
- Société Archéologique de Namur.
- Société des Bollandistes, Brussels.
- Société des Sciences de Semur (*Pro Alsia*).
- Société Finlandaise d'Archéologie, Helsingfors.
- Société d'Histoire et d'Archéologie de Gand.
- Société Nationale des Antiquaires de France.
- Société Préhistorique Française, Paris.
- Société Préhistorique Polonoise.
- Société Royale d'Archéologie, Bruxelles.
- Städtisches Museum für Volkskunde, Leipzig.
- Stavanger Museum, Stavanger, Norway.
- University Library, Tartu, Esthonia.
- Uppsala University.
- Verein für Nassauische Alterthumskunde, Wiesbaden.
- Verein von Alterthumsfreunden im Rheinlande, Bonn.
- Wiener Prähistorische Gesellschaft.

PERIODICALS.

- L'Anthropologie*, Paris.
- Bulletin archéologique polonois*, Warsaw.

LIBRARIES, BRITISH.

- Athenaeum Club Library, London.
- Baillie's Institution, Glasgow.
- Bodleian Library, Oxford.

British Museum Library.
 Chetham's Library, Manchester.
 Church of Scotland College Library, The Mound,
 Edinburgh.
 Free Library, Edinburgh.
 Free Library, Liverpool.
 Mitchell Library, Glasgow.
 National Library of Scotland, Edinburgh.
 National Library of Wales, Aberystwyth.
 Ordnance Survey Library, Southampton.
 Public Record Office Library, London.
 Royal Library, Windsor.
 Royal Scottish Museum Library, Edinburgh.
 Scottish National Portrait Gallery Library.
 Scottish Record Office, Historical Department.
 Signet Library, Edinburgh.
 Trinity College Library, Dublin.
 University Library, Aberdeen.

University Library, Cambridge.
 University Library, Edinburgh.
 University Library, Glasgow.
 University Library, St Andrews.
 Victoria and Albert Museum Library, London.

LIBRARIES, FOREIGN.

Bayerische Staatsbibliothek, Munich, Bavaria.
 Bibliothèque d'Art et d'Archéologie, Université de
 Paris.
 National Library, Paris.
 National Library, Vienna.
 Newberry Library, Chicago, U.S.A.
 Preussische Staatsbibliothek, Berlin.
 Public Library, Hamburg.
 Royal Library, Copenhagen.
 Royal Library, Stockholm.
 Sächsische Landesbibliothek, Dresden.

PROCEEDINGS
OF THE
SOCIETY OF ANTIQUARIES OF SCOTLAND

HUNDRED AND FIFTY-FOURTH SESSION, 1933-1934

ANNIVERSARY MEETING, 30th November 1933.

THOMAS YULE, Vice-President, in the Chair.

Mr Robert Cross and Mr Ludovic M'L. Mann were appointed Scrutineers of the Ballot for Office-Bearers.

The Ballot having been concluded, the Scrutineers found and declared the List of the Council for the ensuing year to be as follows:—

President.

Sir GEORGE MACDONALD, K.C.B., LL.D., D.Litt., F.B.A.

Vice-Presidents.

Brigadier-General Sir ROBERT GILMOUR, Bart., C.B., C.V.O., D.S.O.
The Hon. LORD ST VIGEANS.

FRANCIS J. GRANT, C.V.O., LL.D., Lord Lyon King of Arms.

2 PROCEEDINGS OF THE SOCIETY, NOVEMBER 30, 1933.

Councillors.

The Hon. Sir HEW H. DALHYMPLE, K.C.V.O.	Representing the Board of Trustees.	CHARLES E. WHITELAW, F.R.I.A.S.
JOHN WARRACK, LL.D.		HARRY J. YOUNGER.
JOHN A. INGLIS.	Representing the Treasury.	THOMAS YULE, W.S.
Sheriff C. H. BROWN, K.C.		WILLIAM K. DICKSON, LL.D.
JOHN RICHARDSON, W.S.		H. H. MACKENZIE.
		Professor T. H. BRYCE, M.D., F.R.S.
		WILLIAM ANGUS.

Secretaries.

DOUGLAS P. MACLAGAN, W.S. | W. MACKAY MACKENZIE, D.Litt.

For Foreign Correspondence.

Professor V. GORDON CHILDE, B.Litt. | Professor W. M. CALDER, M.A., LL.D.,
F.B.A.

Treasurer.

J. BOLAM JOHNSON, C.A.

Curators of the Museum.

JAMES CURLE, LL.D., W.S. | JAMES S. RICHARDSON.

Curator of Coins.

ROBERT KERR, M.A.

Librarian.

ALEXANDER O. CURLE, C.V.O.

On the recommendation of the Council the following were elected Corresponding Members:—

ALEXANDER MANN, 22 Boyd Street, Laurieston, Falkirk.
JAMES K. YORSTON, Hutton, Ronsay, Orkney.

A Ballot having been taken, the following were elected Fellows:—

F. W. BAIN, M.C., 29 Palace Court, London, W. 2.
The Hon. JAMES MONCREIFF BALFOUR, O.B.E., 41 Gloucester Square, London, W. 2.
JOHN C. BLACKATER, Jr., F.R.G.S., F.Z.S.(Scot.), The Chemical Laboratory, 570 Gallowgate, Bridgeton, Glasgow, S.E.

ANNIVERSARY MEETING.

3

Sheriff GEORGE BROWN, Berstaane House, St Ola, Orkney.
 The Rt. Hon. THE COUNTESS OF CASSILIS, Newhailes, Musselburgh.
 Rev. JOHN M. CONNOR, D.S.O., M.A., C.Fret., 43 Ormande Avenue, Cathcart,
 Glasgow, S.4.
 ALEXANDER TANCRED CURLE, Berbera, British Somaliland, *via* Aden.
 HUGH FERGUSON-WATSON, Ph.D., M.D., D.P.H., F.R.F.P.S., 25 Palmerston
 Place, Edinburgh, 12.
 CHARLES IAN FRASER, M.A.(Oxon.), of Reelig, Reelig House, Kirkhill, Inver-
 ness-shire.
 JAMES L. GALLOWAY, F.S.M.C., F.I.O., "Coila," Cumnock, Ayrshire.
 W. J. GIBSON, C.B.E., 15 Plewlands Avenue, Edinburgh.
 JAMES DOW GRAY, J.P., "Ballochmyle," Strathmore Avenue, Dundee, Angus.
 THOMAS S. G. HALCROW of Uitenhage, South Africa.
 Sir ROBERT W. HAMILTON, Knt., M.P., F.R.G.S., 161 Oakwood Court, London,
 W. 14.
 Alderman JAMES HARRISON, M.D., Howard Street, North Shields, Northum-
 berland.
 W. INGRAM, K.C., 61 Great King Street, Edinburgh, 3.
 Baron WILLIAM MACKAY, St Andrew's Club, 2 Whitehall Court, London, W. 1.
 Rev. ARCHIBALD MACKENZIE, M.A., B.D., Minister of Ayr Parish, 36 Park
 Circus, Ayr.
 IGNATIUS MACNULTY, 81 Wallace Street, Malden, Mass., U.S.A.
 JOHN MASON, 22 Glenesk Avenue, Dundee.
 WILLIAM MOORE, M.A., 63 Old Dumbarton Road, Glasgow, C. 3.
 Mrs D. B. MORISON, 28 Kingsborough Gardens, Hyndland Road, Glasgow, W. 2.
 JOHN WATSON NAPIER, M.I.Chem.E., Mansfield, Allen.
 JAMES A. T. ROBB, 128 Beechwood Gardens, Ilford, Essex.
 FERGUS ROBERTS, Joint Town Clerk, Brooklands, Dumbarton.
 J. FREDERICK STURROCK, Midholme, Perth Road, Dundee.
 GEORGE VEITCH, C.A., 14 Chalmers Crescent, Edinburgh, 9.
 DOUGLAS W. WATT, M.A., 30 Gemmell Avenue, Cumnock, Ayrshire.
 DAVID WILSON, A.R.L.A.S., 5 Findlay Grove, Restalrig, Edinburgh, 7.

The Secretary read the list of Members deceased since the last Annual Meeting:—

Fellows.

	Elected
Major W. A. BAIRD, Lennoxlove, Haddington	1913
WILLIAM GEORGE BLACK, C.B.E., LL.D., Ramoyle, Dowanhill Gardens, Glasgow	1882
J. T. T. BROWN, LL.D., Ashfield, Cambuslang	1912
J. H. MAYNE CAMPBELL, Carbrook, Bordighera, Italy	1917
JOHN R. W. CLARK, Hon. Sheriff-Substitute for Angus, Westbank, Arbroath	1913
J. HEWAT CRAW, 5 Merchiston Gardens, Edinburgh	1911
WILLIAM DOUGLAS, 29 Inverleith Row, Edinburgh	1916

4 PROCEEDINGS OF THE SOCIETY, NOVEMBER 30, 1933.

C. A. DUNLOP, Director of Municipal Museum and Art Gallery, 52 Chester Road, Warrington, Lancs	1932
Mrs JESSIE PATRICK FINDLAY, The Lochning, Kennoway, Fife	1928
Captain The Rev. JOSEPH R. FRASER, F.R.S.E., The New Manse, Kinneff, Inverlervie	1922
GEORGE GUNN, F.E.I.S., Craighiarten, Wick	1910
EDWARD ATKINSON HORNEL, Broughton House, Kirkcubright	1923
Rev. A. McNEILL HOUSTON, M.A., B.D., D.D., The Manse, Auchterderran, Cardenden, Fife	1802
WALTER G. KLEIN, F.S.A., 7 Eldon Road, London	1922
ANDREW W. LYONS, 12 Melville Place, Edinburgh	1910
Colonel J. F. MACKAY, C.B.E., W.S., White House, Cramond Bridge, Midlothian	1888
ALEXANDER MARSHALL MACKENZIE, LL.D., R.S.A., F.R.I.B.A., 173A Union Street, Aberdeen	1922
JOHN MACKENZIE, Dunvegan House, Dunvegan, Skye	1911
Professor D. W. HUNTER MARSHALL, M.A., LL.B., B.Litt., Department of History, University of Manitoba, Winnipeg, Canada	1930
W. MUIRHEAD MOFFAT, Morven, 11 Duncroby Street, Maryhill Park, Glasgow	1920
JOHN CUNNINGHAM MONTGOMERIE, Dalmore, Tarbolton, Ayrshire	1908
J. L. MOUSSEY, LL.D., W.S., Emeritus Professor of Conveyancing, University of Edinburgh, 21 Glencairn Crescent, Edinburgh	1901
CHARLES MOXON, 77 George Street, Edinburgh	1807
WALTER OLIPHANT, S.S.C., 19 Clarendon Crescent, Edinburgh	1931
ALEXANDER PHILIP, LL.B., F.R.S.E., The Mary Acre, Brechin	1919
GEORGE T. RAINY, C.A., 7 Northumberland Street, Edinburgh	1924
RALPH RICHARDSON, W.S., 29 Eglinton Crescent, Edinburgh	1806
VERNON ROBERTS, F.R.P.S.L., Skirinish, Oban, Argyll	1927
JAMES RUSSELL, Town Clerk of Lidlithgow, 51 High Street, Lidlithgow	1925
Rev. Professor A. H. SAYCE, M.A., LL.D., D.D., Professor of Assyriology, Oxford, 8 Chalmers Crescent, Edinburgh	1903
DONALD G. C. SINCLAIR, 2 Park Avenue, New York City, U.S.A.	1927
Rev. W. CUMMING SKINNER, M.A., Hilltown Manse, Mains Loan, Dundee	1928
ALEXANDER SUTHERLAND, Rumpyard, Watten, Caithness	1922
JOHN THOMAS THORP, LL.D., Brunswick House, 51 Princess Road, Leicester	1907
Sir ROBERT USHER, Bart., of Norton and Wells, Wells, Hawick	1905

The Meeting resolved to record their sense of the loss the Society had sustained in the death of these members.

The Secretary read the following Report by the Council on the affairs of the Society:—

The Council herewith submit to the Fellows of the Society their Report for the year ending 30th November 1933.

<i>Fellowship.</i> —The total number of Fellows on the roll at 30th November 1932 was	1061
At 30th November 1933 the number was	1055
being a decrease of	6

During the year 58 new Fellows were added to the roll, while 35 died, 13 resigned, and 16 allowed their membership to lapse.

Among the names of Fellows who have died during the year the Council desire to make special mention of Major W. A. Baird, Dr W. G. Black, Dr J. T. T. Brown, Mr J. Hewat Craw, Mr William Douglas, and Professor A. H. Sayce.

Major W. A. Baird of Lennoxlove, who joined the Society in 1913 and acted as a Member of Council from 1925 to 1928 and as a Vice-President from 1928 to 1931, was keenly interested in the activities of the Society. His energies were, however, more immediately centred in the work of the East Lothian Antiquarian Society, of which he was President from its inception.

W. G. Black, C.B.E., LL.D., F.S.A., J.P., of Ardmay and Arrochar, was one of the oldest Fellows, having joined the Society in 1882. He was a Member of Council from 1920 to 1923. On retiring from practice as a Writer in Glasgow several years before the War, he devoted his attention to literature and archaeology. He was regarded as an authority on Scottish Church and Parochial Law. Two of his works, *What are Teinds?* and *The Civil and Ecclesiastical Parish in Scotland: its Origin and Development*, are well known. He also wrote a treatise on *Folk Medicine, a Chapter in the History of Culture*, which was subsequently translated into Spanish. He was for many years Secretary of the Glasgow Archaeological Society and subsequently occupied the Presidential Chair. He had made a special study of Scottish mercat crosses and published a volume on the subject in 1913, having previously, with Mrs Black, presented to the Corporation of Glasgow a Mercat Cross which was erected and unveiled in 1930. Under the title of *The Things Around Us*, he dealt very fully with Glasgow archaeology of the past fifty years.

J. T. T. Brown, LL.D., became a Fellow in 1912. He was a distinguished member of the Faculty of Procurators in Glasgow and had been Clerk of the Peace for the Middle Ward of Lanarkshire for many years. His health was none too good, and he was therefore unable to be often in Edinburgh. But he was a lifelong student of early Scottish literature, to the study of which he made more than one very valuable contribution.

6 PROCEEDINGS OF THE SOCIETY, NOVEMBER 30, 1933.

By the lamented death of J. Hewat Craw at a comparatively early age, the Society has sustained a grievous loss. Although known to us chiefly as an enthusiastic student of Scottish archaeology, he was a man of wide interests. As a young man he attached himself to the Berwickshire Naturalists' Club and soon became one of its most active and prominent members. Besides filling at various times the offices of Secretary, Editor, and President, he was a regular contributor to the Club's *Proceedings*, his range of subjects including the archaeology, the local history and various branches of the Natural History of his native county of Berwickshire. One of the last services which he rendered to the club was the compilation of a comprehensive index of the whole.

Joining this Society in 1911, he served as a Member of Council from 1919 to 1922 and from 1927 to 1929, when he was elected one of the Secretaries. While living in Berwickshire his communications to our Society were frequent, but after disposing of his farm and coming to reside in Edinburgh, he placed his services unreservedly at the Society's disposal. In addition to his secretarial duties he undertook the supervision of many excavations in different parts of the country, on behalf of the Society and of H.M. Office of Works. Sad to say, he did not live to complete his most important work, the excavation of the Broch of Aikerness in Orkney, to which he devoted the greater part of four summers. Of a modest disposition, and conscientious to the highest degree, he carried out everything he undertook in a most careful and scientific fashion. His death leaves a blank in the Society that it will be hard to fill.

William Douglas joined the Society in 1916. He devoted much time in the later years of his life to the study of charters and local history, and contributed several papers on such subjects to the *Proceedings*. His "Fast Castle and its Owners" was perhaps the most interesting, and it shed much light on the history of this interesting and romantic ruin. Mr Douglas was of a kindly and retiring disposition. In early life he was a keen mountaineer and wrote many articles and notes on his favourite pastime.

A tribute to the memory and lovable personality of the Rev. Professor Sayce, LL.D., D.D., who became a Fellow in 1903 and acted as one of the Secretaries for Foreign Correspondence since 1904, was read at the February meeting of the Society and will appear in the forthcoming volume of the *Proceedings*.

Proceedings.—An advance copy of the *Proceedings* lies upon the table. The number of papers read before the Society was twenty-three, of which sixteen deal with prehistoric and seven with historic subjects.

The Museum.—The number of acquisitions by the Museum during the year was 2491, donations amounting to 320 and purchases to 2171 specimens, the latter figure including 1923 Roman coins, the hoard found in Falkirk. Apart from the coins, the number of specimens added to the collections must be considered very satisfactory, especially as some of the relics are of outstanding importance.

Chief amongst the acquisitions is the Monymusk Reliquary, one of the finest relics of the Columban Church which has come down to us, and a beautiful example of the art of its period. The Reliquary was purchased by subscriptions received from friends of the Museum, including a most generous contribution, amounting to more than half the purchase price, from the National Art-Collections Fund.

Sir James H. Stewart Lockhart, K.C.B., has presented the flag preserved in the family as having been carried by his ancestors, the Stewarts of Ardsheal, at the Battle of Culloden, and has placed on loan some interesting family relics, including the Ardsheal charm-stone. These form welcome additions to the Jacobite collections.

A carved oak rondel, one of the so-called Stirling Heads, from the palace in Stirling Castle, was bequeathed by the late Colonel J. F. Mackay, C.B.E. A very good selection of Solutrean flint implements from the type station of Solutré in France, presented by Mr Thomas Yule, Vice-President, form a valuable contribution to the collections in the Comparative Gallery. The purchase of 200 Tardenoisian implements from Dryburgh Mains, Berwickshire, and the gifts of scrapers of white quartz from Wardhill, Quendale, Shetland, by Mr James S. Richardson and Mr A. D. Laenille, have added to the value of the collections from these sites already in the Museum.

Additions to the Bronze Age collections have not been so numerous as usual, a beaker from Newlands, Oyne, Aberdeenshire, presented by Mr George Murray, being the only pottery vessel received. It, however, is a very fine specimen. Mr Nicol Martin of Glendale, Skye, presented two socketed bronze axes found together and two stone axes, all picked up on his land. A magnificent example of a bronze spear-head, the finest which has been recorded from Scotland for very many years, found near Ceres, Fife, was purchased. Objects of the Iron Age include an armlet and a finger-ring of bronze found on Cairntable, Ayrshire, presented by Mr Archibald Fairbairn, and a small penannular brooch of the same metal, of unusual if not unique shape, from Eldbottle, East Lothian, presented by Mr Carl Henderson. Further donations of Roman pottery found at the Roman forts at Rough Castle, Stirlingshire, and Croy Hill, Dumbartonshire, have been made by Mr Charles W. Forbes of Callendar and by Carron Company. An

oval Viking brooch of bronze, found many years ago at Ospisdale, Sutherland, was purchased. A beautiful Roman glass jug, found near Turriff, Aberdeenshire, was presented by Mrs Duff Dunbar of Ackergill. Among the relics dating from more recent times, a large wooden bowl with silver mounts, belonging to the Macnabs of Acharn, was purchased, while Mr C. E. Whitelaw has laid the Museum under a further obligation by his gift of an early small sword with a Glasgow maker's mark on it, as well as of two old sets of miniature bagpipes; Mr Victor J. Cumming and Commander How have again presented a number of old Scottish silver spoons.

The Roman coins from Falkirk reached the Museum through the King's and Lord Treasurer's Remembrancer. This hoard is of particular interest as being the largest yet found in Scotland.

The Tweedside Physical and Antiquarian Society, having decided to close their Museum and Library at Kelso, offered to deposit on permanent loan in the National Museum such objects as the Museum cared to choose. A considerable number were selected, amongst which were included the bronze shield found at Yetholm, a number of bronze axes, pottery of the Bronze Age found on the Borders, and the Celtic bell from Ednam.

Excavations.—Mr Craw left full reports and plans of the excavations at Aikerness Broch up till the time he ceased work, and these will be available when the final account of the excavations comes to be written. Small grants were given by the Society to Mr Ian G. Lindsay and Mr James S. Richardson to excavate a Bronze Age cairn at Kalemouth, to Mr W. Kirkness and Mr W. Traill to explore an underground building at Howar, Papa Westray, Orkney, and to Sir George Macdonald for work on the Roman forts at Rough Castle and at Westerwood.

The Library.—The additions to the Library amounted to 145 by donation and 19 by purchase. As usual, a large number of publications by learned societies, etc., were received by way of exchange for our *Proceedings* and by subscription. More than 400 volumes have been bound with the help of the grant from H.M. Treasury towards the binding of books.

Rhind Lectureship.—The Rhind Lectures for 1933 were delivered during the end of October and beginning of November by Mr Eric G. Millar, D.Litt., the subject being "English Illumination from A.D. 700 to the End of the Fifteenth Century." The Lectureship for 1934 has been accepted by Mr Ian A. Richmond, who will lecture on "Roman Monuments and Roman Imperialism."

The Gunning Fellowship.—The Gunning Fellowship for 1933 was conferred on Mr A. J. H. Edwards, Assistant Keeper of the Museum, for the purpose of visiting museums in Wales and in the west and south of England.

The Chalmers-Jervise Prize.—The district selected for the Chalmers-Jervise Prize Essay for 1933 was Berwickshire. Two essays were received, and the prize was awarded to Mr Robert Kinghorn, who wrote on "Some Unrecorded Berwickshire Antiquities." A special prize was awarded to Mr T. L. Stirling for an essay on "Tardenoisian Implements from Berwickshire."

ATHOLL,
President.

NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND,
QUEEN STREET, EDINBURGH.

The Report was adopted on the motion of Dr James Curle, seconded by Mr W. T. Ketchen.

Mr J. Bolam Johnson, Treasurer, read the annual statement of the Society's funds, which was ordered to be printed and circulated among the members. On the motion of the Chairman, a hearty vote of thanks was accorded to Mr Johnson.

MONDAY, 11th December 1933.

SIR GEORGE MACDONALD, K.C.B., LL.D., F.B.A.,
President, in the Chair.

Before proceeding with the ordinary business of the meeting Sir George Macdonald tendered his thanks to the Fellows for electing him President of the Society.

A Ballot having been taken, the following were elected Fellows:—

THOMAS PILKINGTON BURNS, Mortimer Lodge, Mortimer, Berkshire.

Miss J. ELIZABETH GOLDSMITH, M.A. (Hons.), 14 West Holmes Gardens, Musselburgh.

P. A. LEITCH, Assoc.M.Inst.C.E., 4 Silverwells Crescent, Bothwell, Lanarkshire.

IAN M'HARDY, Director of Education, Caithness, Randolph Place, Wick.

HECTOR MACPHERSON, 90-58 186th Street, Hollis, Long Island, New York, U.S.A.

Major J. ROBERTSON REID, M.D., Gatesgarth, Newby, Scarborough.

JAMES TAIT, 431 E. Congress Street, Detroit, Mich., U.S.A.

The following donations to the Museum were intimated, and thanks voted to the Donors:—

(1) By Sir JAMES H. STEWART LOCKHART, K.C.M.G., 6 Cresswell Gardens, South Kensington, London, S.W.5.

Banner of the Stewarts of Ardsheal, preserved in the family as having been carried at Culloden. It is formed of silk, originally blue but now bleached white, bearing a yellow saltire; it measures 6 feet in length by 5 feet in height.

(2) By Rev. ALAN HENDERSON, Congregational Manse, Walls, Shetland.

Button Mould, formed of an irregularly shaped stone, measuring $3\frac{1}{2}$ inches by $2\frac{3}{4}$ inches by $1\frac{1}{8}$ inch, one side being broken off. On one face is a matrix for a button and part of another mould of rectangular shape. There is a perforation at the narrow end. Found at Stapness, Walls, Shetland.

(3) By J. TENNANT GORRON, O.B.E., F.S.A.Scot.
Quill Cutter of Ivory.

(4) By J. HEWAT CRAW, Secretary.

Bead of translucent blue Glass, measuring $\frac{5}{16}$ inch in diameter and $\frac{1}{8}$ inch in thickness, found in a kitchen-midden at the fort at Siccar Point, Cockburnspath, Berwickshire.

(5) By WILLIAM STIRLING of Keir, Dunblane.

Denarius of Titus, found on the Dumbartonshire side of Park Burn, immediately south of the Roman Wall.

(6) By ARCHIBALD FAIRBAIRN, F.S.A.Scot.

Penannular Armlet of Bronze, measuring $2\frac{1}{2}$ inches and 2 inches in cross diameters. It is formed of a thin flat strip of metal, $\frac{5}{16}$ inch broad, decorated with two cord patterns in the centre. The terminals, which are flat and slightly rounded, seem to have been notched round the edge but are worn flat. Bronze Ring with a break in it, $1\frac{1}{4}$ inch in diameter. These were found together under a boulder on the eastern margin of the east cairn on Cairn table, Ayrshire (1944 feet).

(7) ANONYMOUS.

Wooden Vessel, of cylindrical shape, imperfect on one side, cut out of the solid, measuring $5\frac{1}{2}$ inches in height and $5\frac{1}{4}$ inches in diameter, with a lug on one side at the lip, perforated vertically. Found in 1818 in clay near a well said to have been used by monks at Pyothall, Carlops, Peeblesshire.

(8) By J. CATHCART WHITE, 25 Glencairn Crescent, Edinburgh.

Thirty-six Communion Tokens.

(9) By Professor V. GORDON CHILDE, B.Litt., F.S.A.Scot.

Cylindrical piece of Cetacean Bone, measuring $1\frac{5}{16}$ inch long and $\frac{5}{16}$ inch in diameter, notched into three sections, in course of being made into beads, from Skara Brae, Orkney.

Whorl of red Sandstone with hour-glass perforation, measuring $1\frac{1}{16}$ inch in diameter and $\frac{1}{2}$ inch in thickness; Borer and hollow Scraper combined, of grey flint, measuring $1\frac{1}{4}$ inch by 1 inch, and a Perforated Stone, nearly circular, measuring $4\frac{1}{4}$ inches in diameter, from the vitrified fort of Finavon, Angus.

(10) By GEORGE BEVERIDGE of Vallay.

Object made from the leg bone of ox, shaped like a shoehorn, measuring $5\frac{5}{16}$ inches long, from the Old Cattlefold, Vallay, North Uist.

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(11) By the ABBÉ BREUIL, Hon. F.S.A.Scot.

Three eoliths of Flint, $3\frac{1}{8}$ inches by $2\frac{1}{2}$ inches, $3\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, and 3 inches by $1\frac{1}{8}$ inch, found at the base of the Red Crag in East Anglia.

(12) By Rev. JOHN STIRTON, M.V.O., D.D., F.S.A.Scot.

Silver Luckenbooth Brooch, of crowned heart type, measuring $1\frac{1}{8}$ inch in height, with the maker's mark C J for Charles Jamieson, Inverness, and scratched initials M.L. on the back.

(13) By Master ALEXANDER N. G. MUNRO, Newtown St Boswells.

Calcined Flint Scraper, of Tardenoisian type, from Dryburgh Mains, Berwickshire.

(14) By WALTER FINLAY, W.S., 77 Great King Street, Edinburgh.

Iron Key found on the side of Linlithgow Loch.

(15) By Mrs BENNET CLARK, Darby's House, Campden, Gloucestershire.

Four leather Pocket Ink-bottles and Penholders, combined, made by Thomas Clark, Burgess in Edinburgh, great-great-great-grandfather of the donor's husband, his stamp being impressed in the inside of the first three. Two of the objects are in their original paper wrappers. (1) In wrapper marked in pencil "Waved," measuring $4\frac{1}{2}$ inches in length, (2) in wrapper, measuring $5\frac{1}{2}$ inches in length, (3) measuring $5\frac{1}{2}$ inches in length, (4) measuring $7\frac{1}{2}$ inches in length.

(16) By CARL HENDERSON, North Berwick.

Small penannular wire ring Brooch of Bronze, with terminals forming two circular loops at right angles to the plane of the ring, half of the pin remaining, measuring $\frac{5}{8}$ inch in diameter, found at Eldbottle, East Lothian, where a bronze needle was found.

(17) By J. H. STEVEN, Engineers' Department, Edinburgh Corporation.

Iron Nail with a large square head, and thirteen Horse-shoes, found while a drain was being dug in the grounds of the luch, near Cameron Toll, Edinburgh.

(18) By JOHN FRASER, Corresponding Member.

Part of a Roofing Flng, measuring $7\frac{1}{2}$ inches by $3\frac{1}{2}$ inches by $\frac{1}{8}$ inch, from the Earl's Palace, Birsay, Orkney; Knife of yellow Flint, measuring $2\frac{1}{2}$ inches by $\frac{1}{8}$ inch, found near the Broch of Nettlebar, Harray, Orkney.

(19) By W. T. MUIR, Corresponding Member.

Snuff-mull made of an ox horn, with copper hinged lid, from Orkney.

Perforated Stone, measuring $1\frac{1}{2}$ inch by $1\frac{1}{4}$ inch by $\frac{7}{8}$ inch, found on the coast at Birsay, Orkney.

(20) By the Countess V. BAILLET DE LATOUR, F.S.A.Scot.

Horn Spoon from Dunvegau, Skye.

(21) By G. V. WILSON, F.S.A.Scot.

Two Scrapers of grey and white Flint, measuring $\frac{1}{4}$ inch by $\frac{1}{2}$ inch and $\frac{1}{8}$ inch by $\frac{5}{8}$ inch, from Skara Brae, Orkney.

(22) By JAMES S. RICHARDSON, F.S.A.Scot.

Wax Seals of the Chapter of the Cathedral of Ross, at Rosemarkie, Ross-shire; of Marischal College, Aberdeen; and of Mr Robert Williamson.

Handle made from leg bone of ox, measuring $2\frac{1}{8}$ inches long, found in a sandy area south of Aikerness Broch, Orkney.

Twelve Scrapers of white Quartz varying from $\frac{3}{4}$ inch by $1\frac{1}{4}$ inch to $1\frac{9}{16}$ inch by $1\frac{1}{2}$ inch in cross diameters, and four flat Slate Implements, measuring $9\frac{1}{2}$ inches by $3\frac{1}{2}$ inches, $8\frac{3}{8}$ inches by $2\frac{7}{8}$ inches, $6\frac{1}{2}$ inches by $3\frac{1}{2}$ inches, and $4\frac{1}{4}$ inches by $2\frac{1}{4}$ inches; found by the donor on Ward Hill, Quendale, near Sunnburgh, Shetland.

(23) By J. BOLAM JOHNSON, F.S.A.Scot.

Perforated leaden Tag with the figure 5 stamped upon it, found above the quarry on Blackford Hill, Edinburgh.

(24) By F. C. MEARS, F.R.I.B.A., M.T.P.I., 3 Forres Street, Edinburgh.

Seven lead Bullets, lead Pellets, and part of a Cartridge case, found on Arthur's Seat, Edinburgh, above St Anthony's Chapel.

(25) By JOHN BIRNIE, New Mill, through GEORGE MILNE, F.S.A.Scot.

Three Arrow-heads of yellow Flint (1 and 2) barbed and stemmed, measuring 1 inch by $\frac{3}{4}$ inch, and $\frac{7}{8}$ inch by $\frac{1}{16}$ inch; (3) leaf-shaped, $1\frac{1}{8}$ inch by $\frac{1}{16}$ inch, found on New Mill, Rathen, Aberdeenshire.

(26) By JAMES SPENCE, Queena, through W. T. MUIR, Corresponding Member.

Whetstone, perforated at one end, measuring $2\frac{1}{2}$ inches by $\frac{1}{16}$ inch by $\frac{7}{16}$ inch, and three worked Flints from Queena, Birsay, Orkney.

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(27) By JOHN BAIKIE, Upper Bigging, through W. T. MUIR, Corresponding Member.

Rudely made wooden Tumbler, measuring $5\frac{1}{2}$ inches high, from Upper Bigging, Rendall, Orkney.

(28) By CHARLES E. WHITELOW, F.R.I.A.S., F.S.A.Scot.

Small Sword with Brass hilt and blade of diamond section, signed DEOSOLINGEN, in original sheath, made in Glasgow about 1700. Length $35\frac{1}{2}$ inches; blade $29\frac{1}{8}$ inches by $\frac{1}{2}$ inch. This sword, along with one with a silver hilt of Glasgow make (LA 101), formerly presented by the donor, belonged to the family of Scott of Blantyre Ferme, Blantyre. This specimen was for everyday use and the silver hilted one for dress occasions.

Set of miniature Highland Bagpipes, with three drones made of cherry wood with bone and horn mounts. The chanter is of rosewood and is inscribed "W.H.S. 1824." From Perth.

Set of miniature "Union" or bellows Bagpipes, with three drones and chanter of rosewood mounted with ivory and signed NAUGHTAN ABD. John Naughtan "Turner and Musical Instrument Maker" appears in the first Aberdeen Directory of 1824. He died in 1842.

(29) By Captain R. W. L. FELLOWES, Inistrynich, Dalmally, Argyll.

Leather Shoe, found 3 feet under the surface on the bank of the Teatle Burn, near the new bridge on the Dalmally-Claddich road, Argyll.

(30) By A. D. LACAILLE, F.S.A.Scot., the finder.

Levallois End Scraper of Flint on a dressed flake (early Mousterian), and Clactonian dressed flake and struck flake of Flint (Chelles-Achenl), from West Drayton, Middlesex.

Clactonian struck flake of Flint from Barnfield, Swanscombe, Kent.

Eight Scrapers, measuring $1\frac{1}{4}$ inch by $1\frac{7}{8}$ inch, $1\frac{1}{2}$ inch by $1\frac{1}{8}$ inch, $1\frac{1}{2}$ inch by $1\frac{1}{8}$ inch, $\frac{3}{4}$ inch by $1\frac{1}{4}$ inch, $1\frac{1}{2}$ inch by 1 inch, $1\frac{1}{2}$ inch by 1 inch, $1\frac{1}{8}$ inch by $\frac{3}{4}$ inch, and 1 inch by $\frac{5}{8}$ inch; Side Scraper, measuring $1\frac{5}{8}$ inch by $1\frac{1}{8}$ inch; three Worked Flakes, measuring $1\frac{5}{8}$ inch by $\frac{5}{8}$ inch, $1\frac{5}{8}$ inch by $1\frac{5}{8}$ inch, and $\frac{1}{2}$ inch by $\frac{3}{4}$ inch, and a struck Flake, measuring $1\frac{5}{8}$ inch by $1\frac{5}{8}$ inch, of white Quartz, found on Ward Hill, Quendale, Shetland. (See *Proceedings*, vol. lxvii. p. 327.)

(31) By LAUGHLAN NICE, Auchinlea, Greenend, Liberton, Edinburgh. Steel Bullet Mould, measuring $7\frac{3}{4}$ inches in length.

(32) By ERIC BIRLEY, F.S.A.Scot.

Corroded mass of iron Chain Mail from a room in the Headquarters Building in the Roman Fort at Chesterholm, Northumberland—Vindolanda, probable date 196-225 A.D.

(33) By H. E. KILBRIDE-JONES, F.S.A.Scot.

Stone Axe, measuring $5\frac{1}{2}$ inches by $2\frac{1}{8}$ inches by $1\frac{3}{8}$ inch, found at Pond Croft, Keig, Aberdeenshire.

(34) By the Right Hon. Sir HERBERT E. MAXWELL, Bart., K.T., D.C.L., LL.D., F.R.S., F.S.A.Scot.

Small Bronze Mount, measuring $\frac{3}{4}$ inch in length, in the form of a hollow hemisphere in the centre, with a small hollow projection on both sides, the stump of a pin remaining in each side, from Glenluce Sands, Wigtownshire.

(35) By ALEXANDER MANN, 22 Boyd Street, Lanrieston, Falkirk.

Six Henching Balls of Stone, varying from $1\frac{3}{4}$ inch to $2\frac{1}{2}$ inches in diameter, found while remaking the Falkirk-Slamanman road, and a finely made specimen, $2\frac{1}{8}$ inches in diameter, made and used by a miner, James Adam, Blackbraes, Stirlingshire.

(36) By Commander G. E. P. How, F.S.A.Scot.

Silver Tea-spoon, mark J.W., for James Welch, Edinburgh, c. 1750.

(37) By E. J. SUMNER, The Grammar School, Burnley, Lancashire.

Worked Flint (Borer ?), probably of Azilian or earlier date, found on the edge of a bay amongst the shingle to the east of Dunstaffnage Castle, Argyll.

(38) By the Misses ROBERTSON, 16 Wetherby Place, London, S.W.7.

Gold Betrothal Ring, the hoop terminating in a pair of hands supporting a bezel mounted with four pearls, with a seed pearl between each and a small emerald in the centre, eighteenth century. Presented as a memorial of the Robertsons of Kindeach, Ross-shire.

(39) By Mr BAIRNSON, Wiltrow, Dunrossness, Shetland.

Fragment of a thin plate of Bronze, patched and riveted, from Ward Hill, Quendule, Shetland.

(40) By J. M. CORRIE, F.S.A.Scot.

Ovoid Stone Implement with a large oval perforation and two notches at one end, measuring $10\frac{1}{2}$ inches long and $5\frac{1}{2}$ inches broad, and

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an oval pointed Stone Implement of rounded section, pitted towards the pointed end which is abraded like a hammer-stone, and encircled by two pitted grooves round the other end, which is imperfect, measuring $6\frac{7}{8}$ inches in length and $2\frac{3}{4}$ inches in greatest diameter. from Ungistae, Unst, Shetland.

(41) By THOMAS SLATER, Catts, Scalloway, Shetland.

Half of a hoe-like Stone Implement, the top straight and lower side curved, with a large transverse perforation in the centre towards the top, measuring 6 inches in depth and originally about $10\frac{1}{2}$ inches in width, from Trondra, Shetland.

(42) By WILLIAM BROOK, F.S.A.Scot.

Watch in Pinchbeck case, with centre seconds hand, made by Thomas Morgan, Edinburgh, 1767-1803.

Silver Watch with repairers' paper labels inside, bearing the names of William Rutherford, Hawick (3), Thos. Graham, Hawick (1), James Peebles, Selkirk (1), John Paxton, Kelso (2), Rule, Kelso (1).

(43) By WALTER G. GRANT, of Trumland, F.S.A.Scot.

Two Panels of Scots Fir, (1) measuring 23 inches in height and $9\frac{1}{4}$ inches in breadth, with 1622 R.B., I.S. (in monogram) in relief; and (2) measuring $22\frac{1}{2}$ inches in height and $9\frac{1}{4}$ inches in breadth, with 1798 A.M. I.M. rudely incised; from Westness Church (now in ruins), Rousay, Orkney.

(44) By M. TEMPLETON, 79 Hanover Street, Stranraer.

Fragment of the rim of a Neolithic Pottery Vessel with double circular impressions, found by the donor on Glenluce Sands.

(45) By Mrs A. W. DUNN, 4 Lionel Mansions, Brooke Green, London.

Baby's Christening Cap, which belonged to the donor's grand-aunt, Mrs Don, made by Mrs Don's grandmother, Mrs Fairweather, Brechin, about 1800.

(46) By Rev. JAMES M. PATULLO, Minister of Morham.

Seven Glass Beads of twisted tubular shape, three of clear glass, measuring $\frac{1}{16}$ inch, $\frac{5}{16}$ inch, and $\frac{1}{2}$ inch long, one of darkish blue colour, measuring $\frac{5}{16}$ inch long, and three of blueish-green colour, measuring $\frac{1}{16}$ inch, $\frac{1}{8}$ inch, and $\frac{3}{8}$ inch long, from the Kirkyard of Morham, East Lothian.

(47) By Dr PHILIP NELSON, F.S.A.Scot.

Wax impression of a brass Seal of James Hamilton, Duke of Chatelherault, Earl of Arran, in the possession of the donor—quarterly first and fourth, three cinquefoils for Hamilton: second and third, a galley without sails for Arran: the shield surrounded by the collar and badge of St Michael, above the shield a ducal coronet, round the edge † S: IACOBI · HAMILTON: DUX · CASTRI · HERALDI: COMES: ARANIE.

(48) By the Hon. Mrs HENRY LITTLETON, 16 Wilton Place, London, S.W.

Piece of the Cloth of Gold which covered the lead shell which contained the body of King Robert the Bruce in Dunfermline Abbey.

(49) By the Hon. Sir HEW H. DALRYMPLE, K.C.V.O., F.S.A.Scot.

Silver Medal commemorating the marriage of Charles I. and Henrietta Maria, 1625. Variety showing the King with a collar instead of a ruff.

(50) By R. W. N. EVANS, 9 North St Andrew Street, Edinburgh.
Old Wooden Boat-jack, hinged in the centre.

(51) By Mrs R. R. COSENS, 17 Hope Terrace, Edinburgh.

Large Diamond Jubilee Medal, in Silver, of Queen Victoria, 1837-97.
Large Coronation Medal in Bronze, and small one in Silver of King Edward and Queen Alexandra, 1902.
Queen Victoria 3d., with the Lord's Prayer engraved on the back.

(52) By Master DERRICK TURNBULL, 186 Ferry Road, Edinburgh.

Small Croggan of red clay, rim slightly imperfect, measuring 3½ inches in height, 2½ inches in diameter at mouth, 2½ inches at neck, 3½ inches at bulge, and 2½ inches at base, found at Iona more than sixty years ago. This croggan is much older than the others in the Museum.

(53) By Miss MASON INGLIS, formerly of The Manse, Auchterhouse parish, Angus, now of 7 Eglinton Crescent, Edinburgh.

Exciseman's Searcher—a roughly made sword-stick, 32½ inches long, with an iron blade, 26½ inches long, for probing while searching for contraband goods; used on the borders of Angus and Perthshire.

(54) By Miss E. D. DENNISON, 1 Panmure Place, Edinburgh.

Three Valentines shaped like pairs of ladies' gloves, $4\frac{1}{4}$ inches long, $1\frac{1}{4}$ inch broad, one pink and two cream coloured, inside one of the latter is an oval label with the word "Hope," and in the other a similar label with the word "Affection": Ornament consisting of a bouquet of flowers made of human hair, inserted in a straw basket, the hair being that of relatives of the donor; Pair of armlets of human hair with brass mounts; Silver Medal of the Viewforth Golf Club, *obr.* a pair of golf clubs and four balls, applied, and the inscription VIEWFORTH GOLF CLUB 1881, *rev.* the inscription PRESENTED BY/CAPTAIN MACDONALD/FOR BEST HANDICAP AGGREGATE/SCORE OF SEASON/1881/WON BY/ALEXR. DENNISON, father of the donor; Large Bronze Medal of the GLASGOW INDUSTRIAL EXHIBITION, 1865-66; Leather Tawse used in a Berwickshire school more than sixty years ago.

(55) By Mrs DUFF-DUNBAR of Ackergill, F.S.A.Scot.

Roman Jug of olive green Glass measuring $8\frac{1}{4}$ inches in height, found in a sandy hillock along with a large number of amber(?) beads, at Brackenbraes, Turriff, Aberdeenshire, about 1857. Date middle or second half of second century A.D. (See *Proceedings*, vol. lxiv. p. 147, and vol. lxvi. p. 389, also subsequent communication by W. A. Thorpe.)

(56) By bequest from the late Lt.-Colonel J. F. MACKAY, F.S.A.Scot.

Rondelet of Carved Oak from the ceiling of the great hall in the Palace in Stirling Castle, measuring $28\frac{1}{2}$ inches in diameter. Within a raised border, showing foliaceous designs on the outer margin and a double plaited ribbon on the inner, is a boy shown full face, running towards the right and holding in his uplifted hands a ribbon which turns round his limbs and body and ends in two tassels.

The following objects were acquired through The King's and Lord Treasurer's Remembrancer:—

Hoard of 1923 Roman Denarii, found in making a new street between Bell's Meadow and Callendar Riggs, Falkirk, on 9th August 1933, 7 feet under the surface. Clay Pot of red ware in which the coins were found, measuring $8\frac{1}{8}$ inches in height, $4\frac{1}{4}$ inches in diameter at the mouth, $3\frac{3}{8}$ inches at the neck, 8 inches at the bulge, and 3 inches at the base, encircled by three incised lines at the top of the shoulder,

and fragments of a Woollen Fabric stuck in the mouth of the vessel. (See subsequent communication by Sir George Macdonald, K.C.B., President.)

The following purchases for the Museum were intimated:—

Half of a finely polished Stone Axe-hammer (butt end), found at Skooan, Georth, Evie, Orkney.

Highland Brass Brooch, pin complete, ornamented on the face by engraved foliaceous designs, measuring $2\frac{3}{4}$ inches in diameter, found in digging foundations for a house at Selseraiggie Lodge, Kildonan, Sutherland, about 1912 or 1913.

The Monymusk Reliquary, believed to be the Breckenmoor of Columba, bought by subscriptions received from friends of the Museum in Scotland, and by a contribution of more than half of the purchase price given by the National Art Collections Fund. (See subsequent communication by F. C. Eeles, F.S.A.Scot.)

Bronze Spear-head with a pronounced angular midrib running from the point to the base of the blade where it meets the round socket (fig. 1). On each side of the midrib is a raised moulding or rib, which is carried alongside the socket for $\frac{1}{4}$ inch below the wing of the blade. There are no loops at the base of the wings, and the socket shows two pin-holes in the plane of the blade. The spear-head measures $14\frac{1}{8}$ inches in length, the blade being $12\frac{1}{4}$ inches long and the socket $2\frac{5}{16}$ inches. It is $2\frac{3}{4}$ inches in breadth across the widest part near the base. The socket is $1\frac{1}{4}$ inch in external diameter at the mouth, and extends inside the midrib to within 2 inches of the point. Found at a depth of about 3 feet from the surface, between two large boulders, while tiring the surface of the rock at Gathercauld Quarry, near Ceres, Fife.

Collection of Tardenoisian Implements from Monksford Field, Dryburgh Mains, Berwickshire, consisting of four crescentic implements, seven triangles, one trapezium, nine trapezoidal implements, four obliquely pointed implements, a curved blade dressed on one edge, thirteen needlelike implements, nine battered backs (*à dos abattu*), nine pointed and eleven chipped implements, six notched implements

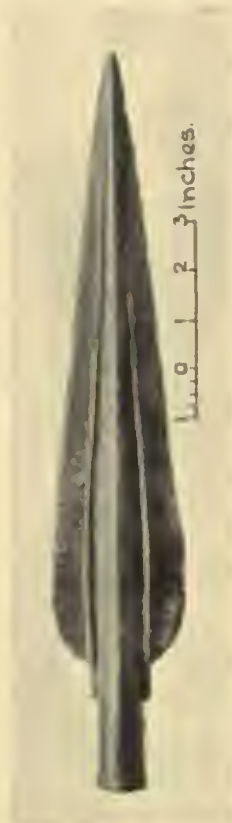


Fig. 1. Bronze Spear-head from Gathercauld Quarry, Ceres, Fife.

(*encoches*), one borer, thirty-five scrapers, and a number of cores or nuclei and worked flakes of green and brown chert, quartz, chalcedony, flint, brown jasper, and stone, and a small Sink-stone formed of a flat water-worn pebble, notched on opposite sides.

Stone Axe, of oval section, tapering to a small butt, measuring 13 inches in length, found at Browland, Bridge of Walls, Shetland.

Oval Viking Brooch, Bronze, the top slightly crushed in on one side, measuring $1\frac{1}{4}$ inches by $2\frac{3}{4}$ inches; the lower shell, which is gilded on the top, is decorated with oblong panels of interlaced designs on the flange; the upper shell, which is imperfect, is pierced and has nine applied hollow bosses, also pierced. The remains of thin silver plaits of Trichinopoly work remain in the hollow grooves between the bosses, and their lacing through the lower shell is seen on the under side. Remains of the iron pin survive at the hinge-plate, and the catch-plate is intact. The imprint of a fabric appears on the under side of the lower shell. Found at Ospisdale, Sutherland.

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By H.M. GOVERNMENT.

Journal of the Commissioners for Trade and Plantations. January 1754 to December 1758. London, 1933.

Acts of the Privy Council of England, 1623-1625. London, 1933.

Calendar of Treasury Books. April 1696 to March 1696-7, Vol. xi.; April-September 1697, Vol. xii.; and August 1699-September 1700, Vol. xv. London, 1933.

Catalogue of Manuscripts and Other Objects in the Museum of the Public Record Office. London, 1933.

Calendar of the Fine Rolls. Vol. xiii.

Calendar of State Papers, Venetian. Vol. xxxiv., 1664-1666. London, 1933.

Calendar of State Papers, Colonial. 1719-1720-1721. London, 1933.

Standing Commission on Museums and Galleries. First Report. London, 1933.

(2) By Dr SIGURD GRIEG, Oslo, the Author.

Middelalderiske Byfund fra Bergen og Oslo. Oslo, 1933.

(3) By THE COUNCIL OF THE ROYAL SCOTTISH ACADEMY.

One Hundred and Fifth Annual Report. Edinburgh, 1932.

- (4) By LA FONDATION SINGER-POLIGNAC COLLÈGE DE FRANCE, Place Marcellin-Berthelot, Paris.

Les Peintures Rupestres Schématiques de la Péninsule Ibérique par l'Abbé Henri Breuil. II.—Bassin du Gadiann. Lagny, 1933.

- (5) By Sir GEORGE MACDONALD, K.C.B., LL.D., D.Litt., F.B.A., F.S.A.Scot.

Jani Gruteri Corpus Inscriptionum ex Regensione et cum Annotationibus Joannis Georgii Graevii. Amstelædami, 1707. Tom i. Tom ii.

Summary of the Verulamium Excavations, 1932. By Dr and Mrs R. E. M. Wheeler. (Reprinted from the St Albans and Hertfordshire Architectural and Archaeological Society's *Transactions*, 1932.)

Römisch-Germanische Kommission des Deutschen Archäologischen Instituts zu Frankfurt-a.M.—Römisch-Germanische Forschungen. Band 6—Der Römische Gutshof Köln-Müngersdorf. Berlin und Leipzig, 1933, und Heft 5. Materialien zur Römisch-Germanischen Keramik.—August Oxé—Arretinische Reliefgefäße von Rhein. Frankfurt-a.M., 1933.

- (6) By THE NORTH OF ENGLAND EXCAVATION COMMITTEE.
Fourth Report for the Years 1931-1932.

(7) By INSTITUTTET FOR SAMMENLIGNENDE KULTURFORSKNING, Oslo.
Serie B: Skrifter xxi. Arktiske Helleristninger i Nord-Norge av Gutorm Gjessing. Oslo, 1932.

- (8) By JOHN DONALD, F.S.A.Scot., the Author.
Past Parliamentary Elections in Greenock. Greenock, 1933.

(9) By R. MURDOCH LAWRENCE, F.S.A.Scot., the Author.
James Milne of Blairton and The Guestrow Armorial Stones. Aberdeen, 1933.
The Skene Mansion and some of its Occupants. Aberdeen, 1933.
Music of the North-East. Banff, 1933.

- (10) ANONYMOUS—through Messrs CONSTABLE & Co., 10-12 Orange Street, London, W.C.2, the Publishers.

The Letters of Sir Walter Scott. 1787-1807, 1808-1811, 1811-1814, 1815-1817.

- (11) By Dr JOHN LINDSAY, M.A., c/o Messrs Lindsay & Co., Ltd., 17 Blackfriars Street, Edinburgh.

Publications of the Clan Lindsay Society, No. 14. Vol. iv., 1933.

22 PROCEEDINGS OF THE SOCIETY, DECEMBER 11, 1933.

(12) By Mrs M. E. CUNNINGTON, Hon. F.S.A.Scot., the Authoress.

An Introduction to the Archaeology of Wiltshire from the Earliest Times to Pagan Saxons, with Chapters on Stonehenge, Woodhenge, Avebury, Sidbury Hill, Barrows, Earthworks, etc. Devizes, 1933.

(13) By C. D'O. PILKINGTON JACKSON, Sculptor, 12 Church Lane, Edinburgh.

The Statuettes from the Scottish Naval and Military Museum, Edinburgh Castle.

(14) By JOHN MACGREGOR, W.S., 3 Coates Crescent, Edinburgh, the Author.

Roll of Tenants on the Menzies Estate in 1682, with their Arms.

(15) By THE SECRETARY, Manx Museum.

The Journal of the Manx Museum. Vol. ii., Nos. 35, 36.

(16) By THE MANX MUSEUM AND ANCIENT MONUMENTS TRUSTEES.

Twenty-eighth Annual Report. Adopted 13th April 1933.

(17) By THE CURATOR OF THE RUSSELL-COTES ART GALLERY AND MUSEUM, Bournemouth.

Bulletin. Vol. xii., Nos. 2 and 3.

(18) By Miss J. C. C. MACDONALD, of Ballintuin, F.S.A.Scot.

National Art Collections Fund. Twenty-ninth Annual Report, 1932. London, 1933.

(19) By Rev. JOHN STIRTON, M.V.O., D.D., F.S.A.Scot., the Author.

The Spanish Match. Lord Cottington's Manuscript. Forfar, 1933.

(20) By G. T. CLINDENING, Adelaide, the Author.

The House of Glendonwyn. Parts ii., iii., vi., vii.

(21) By Rev. ARCHIBALD MACKENZIE, B.D., 36 Park Circus, Ayr, the Author.

William Adair and his Kirk, The Auld Kirk of Ayr, 1639-1684. Ayr, 1933.

(22) By THE DIRECTOR, The Royal Scottish Museum, Edinburgh.

Report for the Year 1932. Edinburgh, 1933.

(23) By Miss SYLVIA W. MURRAY, the Authoress.

David Murray: A Bibliographical Memoir. Dumbarton, 1933.

(24) By ALISTAIR N. TAYLER, B.A., F.S.A.Scot., and Miss HENRIETTA TAYLER, the Authors.

The Ogilvies of Boyne. Aberdeen, 1933.

(25) By THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.

Fifty-sixth Annual Report of the Committee. June 1933. London, 1933.

(26) By THE TRUSTEES OF THE BRITISH MUSEUM.

Catalogue of the Greek, Etruscan, and Roman Paintings and Mosaics in the British Museum. By R. P. Hinks. London, 1933.

A Guide to the Principal Coins of the Greeks. From Circa 700 B.C. to A.D. 270, based on the work of Barclay V. Head. London, 1932.

Photographs of Casts of Persian Sculptures of the Achaemenid Period, mostly from Persepolis. Twelve Plates. London, 1932.

Corpus Vasorum Antiquorum, Great Britain. By F. N. Pryce, M.A., F.S.A. London, 1932.

(27) By LA SOCIÉTÉ PROVINCIALE DES ARTS ET DES SCIENCES D'UTRECHT.

Ijsland Oud en Nieuw. By Dr A. G. Van Hamel. Zutphen, 1933.

(28) By J. FRASER, Corresponding Member.

The Esoteric Studies of Robert Leighton, D.D. Selkirk, 1918.

(29) By CHARLES STEWART, M.A., Glenbardie, Ballater.

Ballater in Royal Deeside: Official Guide.

(30) By W. PERCIVAL WESTELL, F.S.A.Scot., Joint Author.

Romano-British Baldock. By the Donor and Erik S. Applebaum. Reprint from *The Journal of the British Archaeological Association*.

(31) By E. NEIL BAYNES, F.S.A., the Author.

A Stone Axe-hammer of North American Type. Reprint from Anglesey Antiquarian Society *Transactions*, 1933.

(32) By Mrs O'MALLEY, F.S.A.Scot.

Catalogue of Rubbings by the late Lord A. Campbell. (Typewritten.)

24 PROCEEDINGS OF THE SOCIETY, DECEMBER 11, 1933.

(33) By M. L'ABBÉ BREUIL, Hon. F.S.A.Scot., the Author.

Les Industries à Éclats du Paléolithique Ancien. I.—Le Clactonien. From *Préhistoire*, Tome i., Fasc. ii.

Œuf d'Autruche Gravé et Peint et autres Tronvilles Paléolithiques du Territoire des Ouled Djellal (Sahara Septentrional). By the Donor and Dr Clergeau. From *L'Anthropologie*, T. xli., 1931.

Le Paléolithique Ancien en Europe Occidentale et sa Chronologie. From *Bulletin de la Société Préhistorique Française*, No. 12, 1932. Le Mans, 1932.

(34) By R. G. COLLINGWOOD, M.A., F.S.A.Scot., the Author.

Prehistoric Settlements near Crosby, Ravensworth, and An Introduction to the Prehistory of Cumberland, Westmorland, and Lancashire north of the Sands. Reprints from the Cumberland and Westmorland Antiquarian Society's *Transactions*. Vol. xxxiii., New Series. Kendal, 1933.

(35) By Professor Dr ERNST FABRICIUS, Hon. F.S.A.Scot.

Der Obergermanisch-Raetische Limes des Roemerreiches. Lieferung xlix. Berlin and Leipzig, 1933.

(36) By THE BOARD OF TRUSTEES.

Twenty-sixth Report for the National Galleries of Scotland, 1932-33. London, 1933.

(37) By DAVID J. BEATTIE, F.S.A.Scot., the Author.

Oor Ain Folk. Carlisle, 1933.

(38) By The Most Hon. THE MARQUESS OF BUTE, K.T., F.S.A.Scot.

Penninghame Parish Records, 1696-1749. 2 vols. Printed for private circulation, 1933.

(39) By JOHN MOONEY, J.P., F.S.A.Scot.

Church Life in South Ronaldshay and Burray in the Seventeenth Century. By Rev. J. B. Craven, D.D. Kirkwall, 1911.

(40) By J. H. STEVENSON, M.B.E., K.C., F.S.A.Scot.

The Mandragora of the Ancients in Folk-Lore and Medicine. By Charles Brewster Randolph. *Proceedings of the American Academy of Arts and Sciences*. Vol. xl., No. 12. January, 1905.

- (41) By HERBERT HUDSON, The Auberies, Stonham Aspal, Stowmarket, the Author.

Ancient Sun Alignments: the Meaning of Artificial Mounds and Mark Stones. Reprint from *Proceedings of the Suffolk Institute of Archaeology and Natural History*. Vol. xxi., part 2, 1933.

- (42) By J. W. H. JOHNSON, 12 Gramby Road, Edinburgh.
Guide to the Scarborough Museum.

- (43) By Dr A. B. DALGETTY, F.S.A.Scot., the Author.

History of the Church of Foulis Easter, with Illustrations of the Mediæval Paintings in the Original Colours. Dundee, 1933.

- (44) By DON HERMILIO ALCALDE DEL RIO, Honorary Fellow, the Author.
Contribución al léxico montañés. Santander, 1933.

- (45) By ROBERT C. M. AULD, President, New York Scottish Society.
the Author.

Polled and Horned Cattle. Reprint from *The Journal of Heredity*. Washington, D.C. Vol. xviii., No. 7. July 1927.

- (46) By G. G. CLINDENING, Adelaide, the Author.
The House of Glendonwyn. Part V.—Castle and Quarterland.

- (47) By ETSUHIRO SUNAMOTO, the Author.
The Elephant. 2 vols.

- (48) By THE GLASGOW ARCHEOLOGICAL SOCIETY.
The Roman Fort at Cadder. By John Clarke. Glasgow, 1933.

- (49) By THE SECRETARY, League of Prehistorians.
Transactions of the League of Prehistorians. Session 1931-32. Vol. i., part 2. Edinburgh, 1932.

The following Purchases for the Library were intimated:—

The Records of the Pringles or Hoppringills of the Scottish Border.
By Alex. Pringle, M.A., B.Sc. Edinburgh, 1933.
Acta Archæologica. Vol. vi., Fasc. i. Copenhagen, 1933.
Corpus Inscriptionum Latinarum. Vol. xiii., Pars. vi. Berolini, 1933.

26 PROCEEDINGS OF THE SOCIETY, DECEMBER 11, 1933.

Dictionnaire d'Archéologie Chrétienne et de Liturgie. Tome 11, 1^{re} Partie. Maximum (Édit de)—Miniaturistes. Paris, 1933.

A Dictionary of the Older Scottish Tongue. By Sir William A. Craigie, LL.D., D.Litt. Part iii. Berk-Broke. Oxford, 1933.

The Scots Year Book. London, 1933.

The Old Stone Age: A Study of Palæolithic Times. By M. C. Burkitt, M.A., F.S.A., F.Z.S. Cambridge, 1933.

Studien zur Wikinger-Kultur. By Peter Paulsen. Neumünster, 1933.

La Sculpture Irlandaise pendant les douze premiers Siècles de l'ère Chrétienne. By Françoise Henry. Vol. i., Texte. Vol. ii., Planches. Paris, 1933.

Celtic Ornament in the British Isles down to A.D. 700. By E. T. Leeds, M.A., F.S.A. Oxford, 1933.

Handbook to the Roman Wall. By J. Collingwood Bruce, LL.D., D.C.L., F.S.A. Ninth edition. Edited by R. G. Collingwood, F.S.A. Newcastle-upon-Tyne, 1933.

The following Communications were read :—

I.

ROMAN COINS FOUND IN SCOTLAND (III.), INCLUDING A HOARD FROM FALKIRK. BY SIR GEORGE MACDONALD, K.C.B., LL.D., F.B.A., PRESIDENT.

The following list forms a second supplement to the inventory of Roman coins found in Scotland, which was communicated to the Society in 1918.¹ A first supplement was published six years later.² The geographical arrangement of the additions follows that adopted for the original paper. All have been personally examined, except a very few which are cited on the strength of some published account, and I would take this opportunity of thanking the various owners whose kindness has made examination possible.

(A) ISOLATED FINDS FROM ROMAN SITES.

(a) South-Eastern Scotland.

INVERESK.—In 1930 a *denarius* of Vespasian (Coh.², i. p. 369, No. 6), which had been in excellent condition when lost, was dug up in the garden of Inveresk House, and in the same year a much-worn 'second brass' of Trajan (probably Coh.², ii. p. 61, No. 416) was recovered by workmen cutting trenches for the foundations of a new school. Neither find added anything material to our knowledge of the situation or history of the fort.

(c) The Antonine Wall.

MUMRILLS.—At the date of the first supplement the number of coins that could be associated with this fort was five. The continuance of the Society's excavations has brought the total up to twenty-eight. Full details being given in the Report,³ nothing but a bare summary of the accessions is called for here:—Vitellius (1 *A*), Vespasian or Titus (1 *Æ*), Domitian (1 *Æ*), Trajan (1 *A* and 4 *Æ*), Hadrian (4 *Æ*), Sabina (2 *Æ*) and Pius (3 *A* and 2 *Æ*), together with four that were indecipherable (1 *A* and 3 *Æ*).

ROUGH CASTLE.—Three years ago, when the spoil of the excavations of 1903 was being worked through again, a 'first brass,' which had

¹ *Proceedings*, lii. (1917-18), pp. 26-276.

² *Ibid.*, lviii. (1923-24), pp. 325-29.

³ *Ibid.*, lxiii. (1928-29), pp. 550 ff.

evidently been set aside as unidentifiable, was cleaned. It proved to be a Trajan (Coh.², ii. p. 69, No. 503).

CASTLECARY.—Two coins from Castlecary were identified at the same time and in similar circumstances. They were a *denarius* of Mark Antony (Coh.², i. p. 41, No. 35) in very good condition and a somewhat damaged 'second brass' of Hadrian (Coh.², ii. p. 137, No. 369 or, possibly, 370).

WESTERWOOD.—On p. 132 of his *Glasgow and the Clyde* (1876) R. Gillespie mentions that a *denarius* of Hadrian was found about 1866 on the Military Way near Arniebag, a ruined hamlet close to the fort of Westerwood.

KIRKINTILLOCH.—It is perhaps permissible to connect with this fort a worn *denarius* (Coh.², i. p. 406, No. 497), bearing the head of Vespasian but struck after his death by Titus, which was picked up on the line of the Wall in 1933, about 600 yards west of the Peel.

CADDER.—Mr John Clarke's *Roman Fort at Cadder* (p. 82) contains a full description of five coins which came to light during the Glasgow Archaeological Society's excavations. They were Galba (1 *AR*), Trajan (1 *AR* and, probably, 1 *AE*), M. Aurelius (1 *AE*) and, probably, Pius (1 *AE*).

OLD KILPATRICK.—A similar list of fifteen will be found in Mr S. N. Miller's account of his work at Old Kilpatrick.¹ Seven of these had a place in my first supplement. The eight newcomers are:—Domitian (1 *AR*), Hadrian (1 *AE*), Trajan (1 *AR* and 1 *AE*), Pius (1 *AR* and, possibly, 1 *AE*), Lucilla (1 *AR*) and an indecipherable 'second brass.' To these has now to be added a 'second brass' of Hadrian (probably Coh.², ii. p. 186, No. 977), dug up in a garden allotment in May 1933 and forwarded for examination by Mr Ludovic M. Mann.

(d) *Scotland North of the Antonine Wall.*

CAMELON.—(1) An *aureus* of Plotina (Coh.², ii. p. 97, No. 2), ploughed up on the site in 1863, was acquired by the Rev. Lewis H. Irving and subsequently given by him to the mother of the present possessor, Mr Alexander Black, Wellside, Falkirk; it is in very good condition. (2) In 1925 the National Museum acquired a 'first brass' of Trajan (Coh.², ii. p. 51, No. 320), and three years later a much-worn 'second brass' of one of the Flavian emperors, both being associated with small finds of pottery. (3) In the former year I saw another 'first

¹ *The Roman Fort at Old Kilpatrick*, pp. 33 ff. Both this and the Cadder list were compiled by myself.

brass' of Trajan (Coh.², ii. p. 72, No. 531), which had been obtained on Carmuir's Farm by Mr George Anderson, Falkirk. (4) In 1926 a scrutiny of half a dozen coins from Camelon, now in the Falkirk Museum, gave the following result:—a much-worn legionary *denarius* of Mark Antony, a *denarius* of Vespasian (Coh.², i. p. 397, No. 386), a well-preserved *denarius* of Domitian (Coh.², i. p. 495, No. 280), a *denarius* of Hadrian (Coh.², ii. p. 181, No. 903), a 'second brass' of the same emperor, so badly corroded that precise identification was hopeless, and a 'first brass' of Pius (Coh.², ii. p. 323, No. 543). That coins should continue to be discovered here, without systematic search, is a standing testimony to the richness of a site whose importance was not appreciated until a thorough-going excavation had become impossible.

(B) *ISOLATED FINDS FROM NATIVE SITES.*

BROCH OF TORWOODLEE (Selkirkshire).—When the original inventory was drawn up, the "third brass of the Emperor Vespasian," mentioned in *Proc.* xxvi. (p. 78), was inaccessible. On being cleaned, it turns out to be a much-corroded *denarius*, probably of Titus, having on the Rev. a female figure seated l., perhaps Concordia.

COVESEA (Moray).—The curious assemblage of 'late brass' secured by Miss Sylvia Benton in 1929, during her exploration of one of the Covesea caves,¹ included nine genuine Roman pieces—2 with the head of Roma, belonging to the period of Constantine I. (Coh.², vii. p. 330, No. 17, and another probably similar); 1 of Constantine II. (Coh.², vii. p. 377, No. 114); 1 of Constans I. (Coh.², vii. p. 431, No. 176); 2 of Constantius II. (Coh.², vii. p. 455, No. 92, and p. 484, No. 293); 2 of Magnentius (Coh.², viii. p. 9, No. 5, and p. 19, No. 68), both very well preserved; and 1 of Constantius Gallus (Coh.², viii. p. 32, No. 25), in exceptionally good condition. There were, besides, thirty-four of the 'barbarous imitations' with which Richborough and other sites are making us familiar. It is not without significance that several of the forty-three had evidently been worn as ornaments; they were pierced, and in one case a fragment of the wire attachment had survived.

CULBIN SANDS (Moray).—In May 1931 Mr Henderson Bishop sent for inspection a fairly well preserved *denarius* of Hadrian (Coh.², ii. p. 139, No. 393) from the Culbin Sands, an area that has been prolific in occupation-relics of widely separated dates.

¹ *Proceedings*, lxx. (1930-31), pp. 212 ff.

(D) ISOLATED FINDS WITH NO RECORDED ASSOCIATIONS.¹

ANCRUM (Roxburghshire).—Last October Mr C. J. Brown of Melrose showed me a *denarius* of Lucilla (Coh.², iii. p. 216, No. 14) which had been picked up by his son two or three hundred yards from the Roman road near Fairnington farm. It can only be a coincidence that the site is one on which Mr Brown has found both microliths and neolithic implements. But it may not be amiss to recall that the first supplement included a *denarius* of Geta, which was found on Fairnington farm "in a field through which the Roman road passes." Can these be stragglers from a hoard?

HERIOT WATER (Midlothian).—In March 1928 drainers, working in a moss opposite Borthwick Water, turned up a 'second brass' of Vespasian (Coh.², i. p. 407, No. 507) at a depth of 2 feet. It belongs to Mr James Sharp of Heriot Mill.

LEITH.—In September 1929 a 'first brass' of Trebonianus Gallus (Coh.², v. p. 247, No. 86) was brought to the National Museum for identification. Its owner understood that it had been found in Leith. If so, the likelihood is that it was a comparatively modern importation.

MIDCALDER (Midlothian).—A *denarius* of Pius (Coh.², ii. p. 277, No. 68), found at Blackraw near Midcalder, was presented to the National Museum by Mr John Lawson in 1928.

ESKDALE (Dumfriesshire).—In August 1924 a *denarius* of Pius (probably Coh.², ii. p. 303, No. 329) was dug up in the garden of Irvine House, which stands on the right bank of the Esk, opposite the mouth of the Tarras. This is within a mile or two of the Roman fort of Gilnockie.

WHITHORN (Wigtownshire).—Mr J. S. Richardson, Inspector of Ancient Monuments, has shown me a 'small brass' of Claudius II. (Coh.², vi. p. 160, No. 303) dug up at Whithorn.

KIRKCUDBRIGHT.—In 1926 Mr E. A. Taylor (Greengate, High Street) found a similar coin of Constans II. (Coh.², vii. p. 447, No. 45) while working in his garden.

RHINNS OF GALLOWAY.—In 1929 the Rev. R. S. G. Anderson of Inch, Castle Kennedy, forwarded to the National Museum, for a report, a billon coin of Alexandria, said to have been found many years ago at Dhuloch. It had been minted in the thirteenth regnal year of Gallienus (A.D. 265–266), and had on the Rev. an eagle with

¹ The bronze coin from Norrie's Law, which was mentioned in the original inventory (*Proceedings*, iii. (1917–18), p. 286) but which was then inaccessible, has now been re-examined. The description there quoted proves to be correct, except that the piece was not "struck by the Emperor Claudius," but was a contemporary British imitation.

a wreath in its beak. There is no reason for suspecting the account given of the *provenance* of this piece. Billon coins of Alexandria undoubtedly found their way into Britain in Roman times. Four were recorded in the original Inventory and a fifth in the first supplement, the last of these having been recovered at Traprain.¹

KIRKMAHOE (Dumfriesshire).—About thirty years ago a 'small brass' of Valentinian II. (Coh.², viii. p. 143, No. 33) was thrown up by a mole on the farm of Whitehill in the parish of Kirkmahoe. It was shown to me recently by Mr Cameron Smith, H.M.I.S.

STEVENSTON (Ayrshire).—On October 5th, 1929, the *Glasgow Bulletin* published an account of a curious discovery which had been made on the Ayrshire coast by a fisherman gathering bait. On opening a limpet-shell, he had been surprised to catch the tenant in the act of attempting to digest an ancient coin. I got into communication with him and was able to tell him that his find was a billon piece of Alexandria, struck just after the death of the Emperor Carus, whose head it bore (A.D. 283). As he had asked for an opinion, I had to add that its monetary value was trifling. Dissatisfied either with my description or with my estimate, he subsequently sent it to the British Museum for examination. The letter in which he tells how he came by it has been printed verbatim in the *Numismatic Chronicle*.²

Although the strangeness of the circumstances seemed to justify its inclusion in the list, I am inclined to think that this coin may not have been very long in Scotland before it was appropriated by the limpet. After the War many such pieces were brought home by soldiers who had been in Egypt. I had to identify quite a number for their owners. The Stevenston specimen may well have been thrown away when it was realised that it was worthless.

PETERSHILL (near Glasgow).—In 1842 a 'first brass' of Crispina (Coh.², iii. p. 382, No. 6) was dug up in a garden on the lands of Petershill. It was given to Robert Stuart, author of *Caledonia Romana*, who in turn presented it to Dr John Buchanan. In 1925 it was handed over to the Hunterian Museum by Dr Buchanan's grandson.

FIRHILL PARK (near Glasgow).—A paragraph in the *Scotsman* of August 7, 1933, states that a coin, picked up by a boy "on the banks of the Forth and Clyde Canal near Firhill Park," had been identified at the British Museum as a 'small brass' of Crispus. This may, of course, be a comparatively recent loss, and therefore of no historical importance.

¹ See *Proceedings*, lii. (1917-18), p. 250, and lviii. (1923-24), p. 327. Cf. the note by Sir George Hill in the *Numismatic Chronicle*, x. (1900), pp. 315 ff.

² 5th Ser., x. (1930), pp. 337 f.

BLANTYRE.—The *Daily Express* of November 29, 1929, reported that "a brass or copper coin" of the Emperor Vespasian had been unearthed by a Blantyre schoolboy working in a garden.

CALLANDER.—A year or so earlier I identified for Mr F. T. Macfarlane, Leith, a 'second brass' of Nero (Coh.², i. p. 302, No. 339), much worn, said to have been found at Callander.

BRECHIN.—A 'small brass' of Constantius Gallus (Coh.², viii. p. 32, No. 10) came to light here during the restoration of the Cathedral. I saw it in October 1927.

DORNOCH.—In 1931 I was shown at the National Museum a worn 'second brass' of Agrippa (Coh.², i. p. 175, No. 3), said to have been found at Dornoch. The occurrence of so early a coin at a point so far north is surprising and inevitably suggests a modern importation.

NORTH UIST.—In 1931 two late 'second brass' pieces, which had been dug up in North Uist, were brought to the Museum by Dr M. T. Mackenzie—a Constantius II. (Coh.², vii. p. 447, No. 50) in good condition, and a rather worn Magnentius (Coh.², viii. p. 9, No. 7).

FETLAR (Shetland).—Closely analogous was the discovery by the Rev. W. C. Carson of two late 'small brass' pieces in the Mouse Garden, Fetlar—one of Constantine the Great (Coh.², vii. p. 308, No. 666) and the other of Constantius II. (Coh.², vii. p. 447, No. 45). They were got at a depth of 2 feet, and were both in good condition.

HOARD OF SILVER.

It will be observed that, but for the one or two notes of warning already sounded, no special remarks on the foregoing list are called for. All of the coins fall quite naturally into their places in the framework that was sketched in the original inventory. It is otherwise with the hoard that has now to be dealt with, by far the largest Scottish hoard of which there is any authentic record, and quite as remarkable for its composition as for its size. As I propose to publish a detailed catalogue of its contents in the *Numismatic Chronicle*,¹ only a general description of them need be given here. A brief account of the discovery may form a fitting preface.

In connexion with a scheme of improvement which is being carried out within the burgh of Fulkirk by the Town Council, levelling operations have been in progress for some time in the area known as Bell's Meadow, which lies to the north of Cullendar Park. The soil is sandy, and on 9th August last, when the face of a small hill was being cut away, one of the workmen, Robert Wallace by name, was puzzled to find his spade

¹ See 5th Ser., xiv. pp. 1 ff.

encounter unexpected resistance. On investigation the obstacle proved to be a vessel of red earthenware, approximating in shape to a type familiar to excavators on Hadrian's Wall, where it occurs in association with objects of third-century date. The jar must have been cracked by the blow it had received. It broke on being lifted, and there fell from it a hard metallic cluster, covered with a green mould, as well as the remains of a piece of cloth which had evidently been used to protect the mouth. Fragments which detached themselves from the main mass in the fall were seen to be silver coins. A few of these—exactly how many it is impossible to say—were picked up by onlookers and retained. Everything else passed into the hands of the Crown Authorities as treasure-trove, thanks to the prompt and business-like action taken by the Procurator-Fiscal.

The exact spot where the discovery was made will be marked on future issues of the Ordnance Survey Map: it is a little to the north-east of the large house called Belmont. There may be some significance in the fact that it is just over 400 yards north-north-west of a great re-entrant angle in the line of the Antonine Ditch. It would certainly be a convenience for the owner to have in his mind a fixed point from which he would require to walk in a particular direction for so many paces when he wished to disinter the fortune he had buried. The cavity dug for its reception would seem to have been at the bottom of what was then a natural hollow or, possibly, a ditch. The jar was resting at a depth of as much as 7 feet below the modern surface, while above it was a pocket of 'free' sand, which gradually expanded upwards until it was 9 feet broad. These figures would have been excessive in the case of an excavation made for purposes of concealment; so serious a disturbance of the ground would inevitably have attracted attention and thus served to defeat the object in view.

On their arrival in Edinburgh the contents of the cache were transmitted by the King's and Lord Treasurer's Remembrancer to the Museum in order that they might be properly examined. It proved possible to reconstruct the earthenware jar, all but a few sherds of which had fortunately been recovered. The cloth, too, was interesting, showing as it did distinct traces of a pattern of checks. But it was, of course, the coins which demanded and received the lion's share of attention. The Museum staff were engaged for nearly three weeks on the tedious and delicate task of separating the cluster into its component parts and removing from each the accretion of copper salts by which it was disfigured. The work was most skilfully done and the result much more satisfactory than might have been anticipated. In the end the coins emerged from the ordeal very much in the guise they must have worn on the day

they were entrusted to the care of Mother Earth. The various elements in the find are now grouped together in a show-case, and the Society is indebted to Mr Edwards for transforming an amorphous heap into what is destined to be a notable and popular exhibit. A few of the better preserved and more interesting specimens have been placed in the safe. A preliminary sorting by Dr Callander saved me much trouble.

The total number examined—inclusive of one or two stragglers which did not reach the Museum, but which I have seen in other hands—was 1925. We may accordingly assume that there cannot have been many less than 2000 in the jar, constituting by far the largest Roman hoard that has ever come to light in Scotland. All were *denarii* except a single Greek coin, a Lycian drachm of Trajan, the size and weight of which, combined with the wear it had undergone, rendered it hardly distinguishable from its companions. More than three centuries had elapsed between the issue of the oldest coin and that of the most recent, for the earliest had been struck *circa* 83 B.C. while Rome was still a Republic, and the latest had been minted by Alexander Severus in A.D. 230 (fig. 1). From Nero onwards the array of heads of Emperors and of members of their families was practically continuous. As the condition of the latest coin showed that it had not been hidden away until after it had been in circulation for some years, we may infer that the hoard was concealed about A.D. 240 or 250. Long before then the Romans had finally withdrawn to the south of Hadrian's Wall. How did such a mass of their money come to be buried on the Forth and Clyde isthmus? If we are to get a satisfactory answer, we must make the coins tell their own story.

Their number is very impressive, and so too is the length of the period which they cover. These, however, do not carry us very far. It is otherwise with a feature whose importance might not be immediately obvious to the casual observer. They varied enormously in the amount of wear to which they had been subjected. Some were well or very well preserved and a few were even brilliant, while others—probably the great majority—had been more or less badly rubbed in passing from hand to hand. Concurrently, therefore, with the identification of each, a careful note was made of its condition. That some other factor than age had been at work became almost at once apparent. Within a small group, whose types and inscriptions proved that they had left the mint simultaneously, one or two would stand out as being in conspicuously good condition compared with the remainder. That could only mean that they had ceased to circulate sooner, occasionally very much sooner. Like Rome itself, the hoard was not built in a day. In

other words, it is the fruit of a gradual process of accumulation extending over many years. We know that the process came to an end about A.D. 240 or 250. Let us now try to go further and see when it began.

Practically the whole of the first-century pieces, including 350 of Vespasian, who was more numerously represented than anyone else,

REPUBLICAN DENARIUS (83 B.C.)--1	M. AURELIUS AND L. VERUS-----3
MARK ANTONY (31 B.C.)-----17	LUCILLA-----15
NERO (54-68 A.D.)-----27	COMMODUS (177-192 A.D.)-----41
GALBA (68-69 A.D.)-----14	CRISPINA-----11
OTHO (69 A.D.)-----7	DIDIUS JULIANUS (193 A.D.)-----1
VITELLIUS (69 A.D.)-----15	CLODIUS ALBINUS (193 A.D.)-----6
VESPASIAN (69-79 A.D.)-----350	SEPTIMIUS SEVERUS (193-211 A.D.)---55
TITUS (79-81 A.D.)-----63	JULIA DOMNA-----34
JULIA TITI-----1	CARACALLA (198-217 A.D.)-----33
DOMITIAN (81-96 A.D.)-----85	PLAUTILLA-----2
NERVA (96-98 A.D.)-----19	GETA (209-212 A.D.)-----13
TRAJAN (98-117 A.D.)-----215	MACRINUS (217-218 A.D.)-----2
HADRIAN (117-138 A.D.)-----235	DIADUMENIANUS (218 A.D.)-----1
SABINA-----19	ELAGABALUS (218-222 A.D.)-----27
AELIUS (136-138 A.D.)-----5	JULIA PAULA-----1
ANTONINUS PIUS (138-161 A.D.)--205	AQUILIA SEVERA-----1
FAUSTINA SENIOR-----104	JULIA SOAEMIAS-----7
PIUS AND M. AURELIUS-----7	JULIA MAESA-----8
M. AURELIUS (161-180 A.D.)----122	ALEXANDER SEVERUS (222-235 A.D.)--34
FAUSTINA JUNIOR-----100	JULIA MAMAEA-----6
L. VERUS (161-169 A.D.)-----13	
TOTAL 1925	

Fig. 1. List of Coins.

bore every mark of prolonged and constant usage. The earliest for which a circulation-life of anything less than fifteen or twenty years could reasonably be postulated had been struck at the very end of the reign of Domitian or during the reign of Nerva. At that point a steady improvement set in. There was no lack of worn examples among the later issues, but always—with a significant exception to be referred to later—there was a high proportion which were well or very well

preserved. We may infer that the foundations of the hoard were laid in the first quarter of the second century, and the inference is confirmed by the presence of the Republican *denarius*. Owing to the superior quality of the metal of which they were composed, these *denarii* continued to be current for well over a century after the establishment of the Empire.¹ They were ultimately 'called in' by Trajan, and this particular specimen must surely have been stored away before the news of their demonetization had spread as far as Britain.

The facts on which the conclusion just reached is based are quite inconsistent with the suggestion of an army chest and equally so with that of loot brought back by raiders. In the contents of the jar we have the outcome of perhaps 120 years of thrift, the family savings of four generations. We do not know, nor can we ever know, how the money was made. But we have the best of reasons for believing that it was made to the north of Hadrian's Wall and that the owners were not Roman intruders. They were dwellers in Caledonia. In this connexion it is relevant to recall that fifteen or sixteen years ago a survey of the sporadic finds from various parts of Scotland furnished unmistakable indications that for at least three hundred years Roman coins had served as a native currency.¹ The testimony of the hill-settlement on Traprain Law was specially illuminating.² There—except for what may perhaps be an accidental gap between Faustina Senior and Gallienus—the sequence that came to light was almost continuous down to Valentinian II., and the coins invariably occurred in the appropriate occupation-level. Yet for at least three-fourths of the time the *limes imperii* ran on the south of Cheviot. It is, therefore, anything but surprising that a hoard of Roman coins unearthed in Scotland should have been a native hoard. Indeed one may suspect this to have been the case with most, if not all, of those that have previously been recorded. That would certainly be the easiest way of accounting for their occurrence in districts which show no other sign of having been under Roman influence—Fife and Kinross, for example, which have been unusually prolific, and even distant Nairnshire.³

Up till now there has been no opportunity of putting the matter to the test by sifting the internal evidence, for the Falkirk find is the first hoard of Roman silver from Scotland that it has been possible to have scrutinized with any approach to thoroughness. The full significance of that evidence can only be appreciated when account is taken of the evidence of analogous finds in the Romanized part of the island. Two

¹ See *Proceedings*, lii. (1917-18), pp. 296 f.

² *Ibid.*, p. 294, and lviii. (1923-24), p. 327.

³ *Ibid.*, lii. (1917-18), pp. 277 ff.

such are particularly suitable for comparison—a hoard of 3169 from “somewhere in the East of England”—actually, I understand, from Colchester—which was published by Sir John Evans in 1898,¹ and a hoard of 507 from Denbighshire, which was described by Mr Mattingly in 1923.² The former included 107 specimens, and the latter 3 specimens, of the *antoninianus*, a new denomination introduced by Caracalla and probably tariffed as a double *denarius*. Otherwise, there were only *denarii*, as at Falkirk. In the absence of detailed information as to the condition of the coins in the two southern hoards, the comparison must necessarily be less complete than could have been desired. Even as things are, however, we can learn something from the statistics.

In all three cases the latest name in the list is that of Julia Mamaea. Concealment, therefore, took place at approximately the same time. That being so, we cannot but ask why there should have been no *antoniniani* at Falkirk. The simplest and most obvious explanation is that the ‘new-fangled’ denomination was not recognized for currency purposes in the region where the hoard was accumulated. Nowhere in Britain is that more likely to have been the position than in Scotland. It is notorious that in such matters semi-civilized peoples are instinctively conservative. It is worth adding that this may be the reason why the proportion of *antoniniani* is so very much lower in Wales than at Colchester—3 out of 507, as against 107 out of 3169. Although Denbighshire was within the province, it lay altogether apart from the main current of business life, a geographical accident to which may also be due the presence of no fewer than 12 legionary *denarii* of Antony, very old-fashioned coins, which are more than a little out of place in an assemblage whose general composition indicates that its formation began about the close of the second century.³ It is safe to guess that they and the 21 *denarii* of Vespasian, which were included in it, must have been as heavily worn as the corresponding pieces at Falkirk.

So far as can be judged from the figures, the foundations of the Colchester hoard were probably laid towards the close of the reign of Hadrian. The first beginnings of the Falkirk hoard must be placed (it will be remembered) about a generation earlier, and we should therefore naturally expect it to contain a relatively larger representation of the money of the Flavian Emperors. But the actuality is far in excess of the expectation. At Falkirk the coins of Vespasian and his family numbered 499 out of 1925 (or more than 25 per cent.) as against 62 out of 3169 (or less than 2 per cent.) at Colchester. Even a generation's

¹ *Num. Chron.*, 3rd Ser., xviii, pp. 120 ff.

² *Ibid.*, 5th Ser., iii, pp. 152 ff.

³ The reason for their continued circulation is explained in *Proceedings*, iii, (1917-18), p. 297.

difference in date would be insufficient to produce such a result. Some other influence must have been at work. And here, as in the case of the *antoniniani*, it is to geography that we must turn for help. A combination of the evidence from number with that from condition leads to the conclusion that the founder of the Falkirk hoard must have made his 'pile' in some region where the contemporary currency consisted mainly of worn *denarii* which bore the image and superscription of Vespasian or of one or other of his sons. Once again Scotland, and Scotland alone, would seem to fill the bill. The frontier troubles which led to the erection, first of the Tyne and Solway Wall, and then of the Wall of Antoninus Pius, must have involved serious and lengthy interruptions of normal intercourse. The flow of Roman coins into and out of North Britain would be temporarily checked, and there would be no opportunity of replacing old by new. The natives, who had grown accustomed to their use, would have to be content with the specimens that had travelled from beyond Cheviot in days that were more peaceful.

The Falkirk hoard, then, is a native hoard, although the coins that went to make it up are Roman coins. Looked at in that light, it will be seen to reflect the history of the period during which it was being amassed. Two points stand out distinctly. In the first place the astonishing abundance of Flavian silver affords striking confirmation of a deduction drawn fifteen years ago from the first complete survey of the gold-finds. The Flavian and pre-Flavian issues amounted to about 70 per cent. of the whole of these, while Trajan absorbed some 18 per cent., leaving only a beggarly allowance of less than 12 per cent. for Hadrian and his successors.¹ Here there was no question of the gold being a native currency, since many of the *aurei* came from Roman forts, and none of them from native sites. It appeared to follow that the 'Agricola' occupation could not possibly have been limited (as used to be supposed) to the three or four years of active campaigning which ended with that general's recall. As Tacitus says, '*tradiderat successori suo provinciam quietam tutamque*.'² It must have been then that the inhabitants of North Britain learned to employ Roman currency, and then that the great influx of Flavian *denarii* took place.

The second point of interest exhibits the other side of the shield. The storms that raged on and about the frontier in the latter half of the second century seem also to have left their mark. Thus, at Falkirk there were only 41 coins of Commodus, as compared with 247 or fully six times as many at Colchester. Taken by itself this need not perhaps have had any particular meaning, since in the case of most of the third-

¹ *Proceedings*, lli, (1917-18), pp. 255 ff.

² *Agricola*, c. 40.

century emperors the disparity was even greater, showing that latterly the Colechester capitalist was putting by money much more rapidly than his counterpart in Central Scotland, it may be because the northward flow of *denarii* was now little more than a trickle. What is really significant is the poor condition of most of the 41. The few exceptions were minted either before the outbreak of the war in Britain—according to Dio, “by far the greatest” in which Commodus was ever engaged¹—or after it had been brought to a more or less satisfactory conclusion. While hostilities were in progress, economic activities were paralysed. At this juncture the most fruitful comparison is with the issues of later emperors and their families. Among these there are invariably some which show signs of wear, but there is never any lack of others which are in good or even excellent condition. The *denarii* of Septimius Severus and his sons are typical. It is true that during the greater part of the reign of Severus the relations between Rome and North Britain were hardly more conducive to the maintenance of friendly intercourse than they had been during the reign of Commodus. But with the advent of the peace patched up by Caracalla after his father's death there would surely come a revival of trade. And long before that there was an occasion when coins of Severus and his family were conveyed into Southern Scotland by a channel that was not commercial. Dio tells us that Virius Lupus, who became governor of Britain in A.D. 197, was compelled to purchase peace from the Mætae at the price of a large sum of money.² The language used by the historian implies that the indemnity was paid in cash—an implication which has not, I think, been drawn attention to before, and which furnishes one more proof that Roman money passed current among the natives.

There is a final question which one is tempted to ask, even although it can only receive the most general reply. Why was all this treasure, so plainly “heaped together for the last days,” allowed to lie untouched until in the fullness of time it should serve as a parable of the vanity of riches? When a number of hoards that have obviously been buried about the same time are discovered within the same geographical area, it is often possible to connect them with warlike operations of which written history has preserved a record. Thus the Scottish hoards which were catalogued in my original inventory appeared to fall into two classes, associated respectively with the earlier and with the later of the two troubled epochs to which there has just been occasion to refer—the latter part of the second century and the beginning of the third. After the departure of the Romans thick darkness descends upon Central Scotland. It has no history. That it was nevertheless not entirely

¹ Dio, lxxii. 8.

² *Ibid.*, lxxv. 5.

happy is the lesson of the Falkirk hoard. The jar must have been buried at some moment when serious disturbances were afoot, when the life and property of civilians were no longer safe. The man who knew where it was hidden was overtaken by the slayers, and his secret perished with him.

II.

THE BROCH OF MIDHOWE, ROUSAY, ORKNEY. BY WALTER G. GRANT, F.S.A.Scot., AND J. GRAHAM CALLANDER, LL.D., F.S.A.Scot.

Printed at the end of the volume.

III.

INVERMARK CASTLE. By W. DOUGLAS SIMPSON.

M.A., D.LITT., F.S.A.Scot.

The tall tower of Invermark stands at a height of about 850 feet near the head of Glenesk, on a steep bank overlooking from the north the rocky and boulder-strewn channel of the Water of Lee, a short distance below the point at which it emerges from the lonely loch of the same name. To the west the Castle looks out upon higher ground, while to the north it is protected by the Water of Mark, which joins the Lee Water just below the Castle, and forms with it the infant North Esk. Thus the situation between the two converging streams is tactically a very strong one, while strategically (see Map, fig. 1) the Castle occupies a position of considerable importance as an outpost to Edzell Castle, the headquarters of the Lindsays of Glenesk. It sentinelled the upper reaches of the Glen and controlled the Fir Mounth, Forest of Birse Mounth, and Mounth Keen passes, which here debouch from the north upon the *talkessel* formed by the valleys of the Tarf and the North Esk. The position was therefore well chosen to impede the movement of caterans across the Mounth between Mar and the Braes of Angus.¹ At present, save for the plantations around Invermark Lodge and the birch trees that line the river, the country at the lower end of Loch Lee is bare and desolate; but as late as the closing years of the eighteenth century the underslopes were thickly clad with oaks and pines, and the Castle was approached by fine beech avenues.²

The tower (see Plans, fig. 2) measures 38 feet 6 inches long and 27 feet 3 inches broad, and its walls in the basement are 5 feet 6 inches thick. It contains four storeys and a garret, each consisting of a single room, and the basement alone being covered with a plain barrel vault on the long axis, 8 feet 6 inches high. The entrance (fig. 3) is on the first floor, on the south side near the west end, and at a height of 9 feet above the present ground-level. It is a plain but well-formed round arched portal with a 4-inch chamfer, and measures 6 feet 4 inches high and 2 feet 10½ inches in exterior width. The portal was doubly defended, first by a wooden door that has disappeared, and next by the interesting iron yett which still remains

¹ See *Proceedings*, vol. lxx, p. 117, with Onchterlony of Guinde's account, quoted there.

² A. Jervise, *Land of the Lindsays*, 2nd ed., p. 110.



Fig. 1. Map showing the Strategic Position of Invermark Castle.

in position. On the exterior faces of the jambs grooves and batholes for a timber staging of access are still apparent.¹ The door opens directly on to the hall, and on its left side a circular stair, 4 feet wide, leads down to the cellar. This stair is very crudely and irregularly built. The cellar is lit only by the roughly formed, broad mouthed, horizontal gunloops, about 3 feet wide, which are pierced in its walls on all fronts. Above the north shot-hole at the east end, both within and without, are

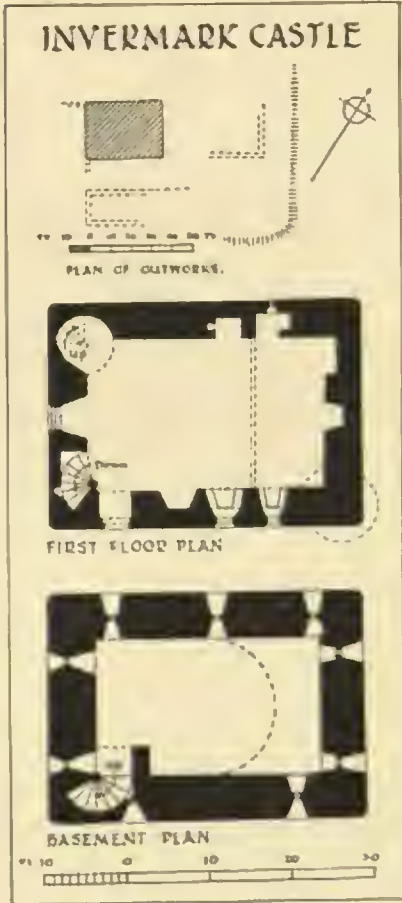


Fig. 2. Invermark Castle: Plans.



[Photo N. S. Curzon.]

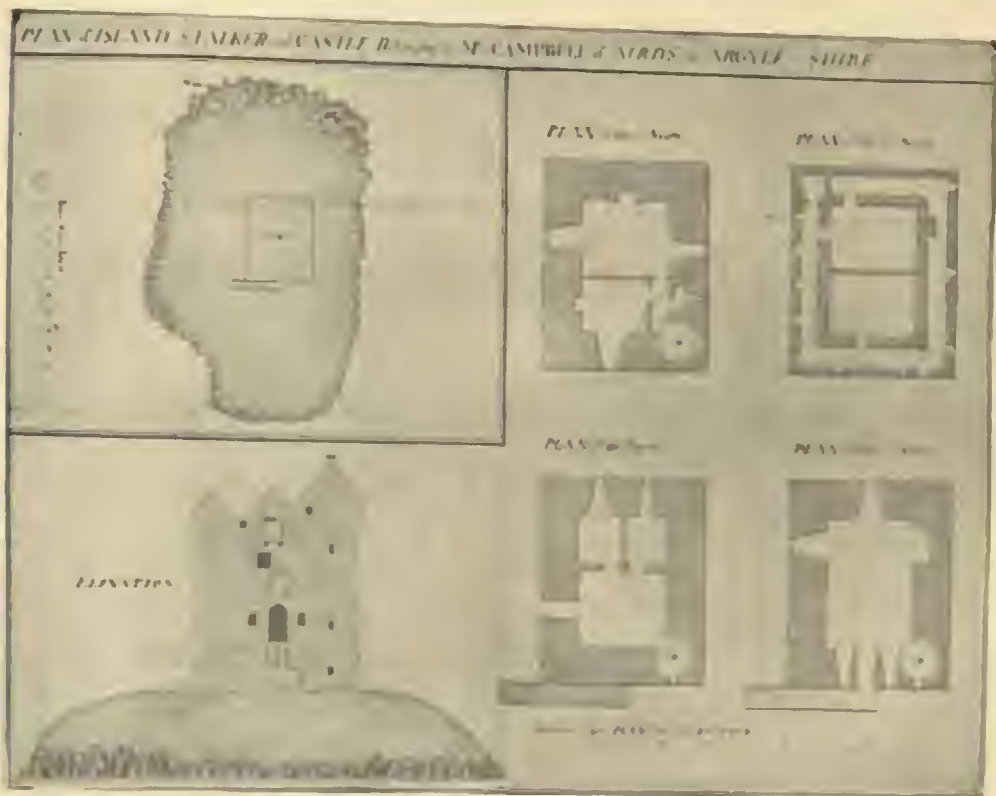
Fig. 3. Invermark Castle: Entrance and Iron Yett.

indications of disturbance in the masonry, as if some fitment, possibly an external trough and water-supply conduit, had been withdrawn.


On the hall level are two fireplaces, one on the south side and one

¹ A stone stair with a wooden gangway is shown in an old survey of Castle Stalcraig, Applin, now in the British Museum, and reproduced herewith (fig. 4). (I am indebted to Mr James S. Richardson, F.S.A.Scot., for drawing my attention to this survey.) At Castle Stalcraig batholes very like those at Invermark still exist (see MacGibbon and Ross, *Castellated and Domestic Architecture of Scotland*, vol. iii. p. 164).

in the east end; from this fact, and also from the position of the two windows close to each other in the south front and two garderobes similarly situated opposite, it is evident that this flat was divided by a light partition into two portions, a larger west one forming the hall proper and a smaller eastern one serving as a kind of rudimentary withdrawing room. The latter, in addition to one of the two windows



[Photo H.M. Office of Works.]

Fig. 1. Castle Stalker, Appin, from an Old Survey in the British Museum,  xlix. 40.

and garderobes and the fireplace all above referred to, has a large arched caplury or dresser-recess in the north-east corner. The hall itself, in addition to the features already described, has another wide window midway in the west front. The two windows placed close together in the south front, and lighting the hall and private room respectively, have roughly fashioned stone side-benches. At this level the internal dimensions of the tower are about 29 feet 6 inches by 19 feet. In the north-west corner of the hall a spiral stair, 7 feet

in diameter but now destroyed, led to the upper floors: it was so arranged as to project inwardly upon each storey in turn.

Joist-holes show that the hall was ceiled at a height of 12 feet. The floor above rested on a scarcement, and the garret floor again was mortised into the walls with joist-holes of a smaller size than those above the hall. Those upper rooms were similar in general



[Photo N. A. Cresson.]

Fig. 5. Invermark Castle: View from South-east.

arrangement to those of the main floor. Like the hall, the third floor-level was divided into two, as appears from the presence of two fireplaces close beside each other in the north wall. In the topmost storey fragments of the ancient grey plaster still adhere to the side-walls.

Externally (figs. 5 and 6) the tower is built with rounded angles and a pronounced batter, giving a very robust effect. At the eaves-level the angles are corbelled out to the square, above which the gables are finished with flat skews and projecting curved "peat stones." On the wall-head is a chamfered cornice. The four chimneys—one on each gable and one in each front—have a plain blocking course with

sloped cope. In the south chimney are two voids, the lower one lighting the garret-chamber and the upper one ventilating the roof timbers, while over all is a sunk empty panel. The north chimney has a similar panel above a single void. At the south-east angle of the tower a large and tall round turret of two storeys is carried out on bold continuous corbelling: it is equipped with small circular pistol-



[Photo N. S. Courun.]

Fig. 6. Iovermark Castle: View from West.

loops, of which one has a sighting aperture, while there are also one oval gunloop with a redented splay, and a twinned gunloop likewise having redented splays. The lower stage of the turret is entered at the third floor-level by a giblet-checked door in a diagonal wall; the upper stage was reached from the garret. As usual in late Scottish domestic work, the turret is deeply inset into the parent building, and is also depressed below the eaves-level, the constricted gable end above being properly finished off with a curved "peat stone" like the others. The chamfered cornice on the main wall-head is stepped up and continued round the turret. The whole design and workmanship of this turret

exhibits the most careful and elegant finish. The total over-all height of the tower is 66 feet, while to the eaves-level it is 47 feet.

It is evident on a close inspection of the exterior that the upper portion, above the second floor, is of more recent date than the lower part. At the level mentioned stubs of a former corbelled parapet are clearly distinguishable all round the building; mostly these corbels have been cloured away flush with the wall, no doubt so as to be harled over; but in one or two places they still project as mutilated stumps. Below this level the masonry of the Castle is composed of massive boulders of granite and schist, with schistose and slaty pinnings; above it, the masonry, though of similar materials, exhibits a markedly finer texture and a lighter tint. Also, below the level of the old corbel-table the window openings have uniformly a $3\frac{1}{2}$ inch chamfer, while above the corners are rounded. The large west window of the hall was slapped out when the tower was remodelled—as appears both from the fact that it shows the rounded edge-moulding of the newer work, and also because it has been thrust out above and partly through an older window, the sole, cut-away lintel and north jamb of which still remain and show the older chamfer. In the upper part of the tower, in addition to the firearm loops already described in the turret, plain round gunloops without an external splay are found at various places in the main building.

The date of the heightening is clearly fixed by the flat skews and by the details of the angle turret, all of which bespeak the early seventeenth century. The profile of the turret corbels and its redented gunloops are identical in pattern with those of the summer-house at Edzell Castle, built by David, Lord Edzell, in 1604¹—so that we may confidently infer that the remodelling of the tower was his work. The plain horizontal gunloops and the broad chamfered windows in the lower portion show that this belongs to the first half of the sixteenth century. It should be noted that the dressed work in the tower, both in its older and in its newer portions, is all very carefully wrought in freestone of a warm red colour. All the windows are grooved for glass, and five in the topmost storey still retain their grilles of iron bars intersecting in the usual manner.

The yett (figs. 3 and 7) consists of six vertical and nine horizontal bars, the mode of penetration as usual being reversed in diagonally opposite quarters. It is swung on two hinges, and is secured by a stout bolt and hasp sliding in two staples midway in the height of the yett. Near the top there is also a single staple to which no bolt-hole corresponds in the wall. From this fact, and also because the yett is

¹ *Proceedings*, vol. lxxv. pp. 164-7.

incomplete on the top, shewing the commencement of an arched head much too large to fit the door of the tower, it seems probable that the yett was brought hither from somewhere else—perhaps from Edzell. It is said to have been of local workmanship.¹

To the south and east of the tower (see Plan, fig. 2) foundations of



[Photo J. N. Hanna, Brechin.]

Fig. 7. Invermark Castle: Interior View of Iron Yett.

outbuildings still remain. From the southern of these the entrance on the main floor of the tower would have been reached, by the timber staging of which traces exist. Some garbled recollection of this arrangement is probably embodied in the rather marvellous description of Jervise,² who avers that the Castle was "entered by a huge draw-bridge, one end of which rested on the doorsill of the first floor of the Castle, and the other on the top of a strong isolated erection of freestone that stood about 12 feet south of the front of the tower.

¹ Jervise, *op. cit.*, p. 15.

² *Ibid.*, p. 92.

This was ascended on the east and west by a flight of steps, and the bridge being moved by machinery the house was rendered inaccessible, or otherwise, at the will of the occupant."

In one of these outbuildings the cooking of the household, at all events during peaceful times, must have been done, as there is no kitchen within the tower. Also there is no trace of a well within either the tower or its precincts; it would be difficult to sink one on the rocky site, and the inhabitants probably depended on the river for their water-supply. Such a tower was, of course, not intended to resist a prolonged blockade, but would be almost impregnable against a sudden raid of caterans whose safety depended on swift emergence and swifter disappearance.

There are distinct traces of a metalled trackway leading from the Castle westward up the bank of the Lee, between it and the present road.

The history of the tower, so far as it is preserved, agrees fully with its architectural features. It has been stated that there was a Castle here in the fourteenth century, but of this no contemporary voucher appears to exist, and it is at all events certain that no part of the present building dates back to so remote a period. The *New Statistical Account*¹ says definitely that the tower was erected in 1526, and although I have found no authority for this statement the date would very well suit the lower portion of the building. The old *Statistical Account*, published in 1794, says that the Castle was built "about the beginning of last century";² but this is evidently a tradition of the reconstruction carried out at that time. In the *Register of the Great Seal* the "tower, fortalice, and manor-place of Invermark" appears first on record in 1554; and in 1588 we have the " fortalice, manor-place, demesne lands, and malt kiln of Invermark"—an inventory that recurs in subsequent writs down to as late as 1715.³

It was at Invermark Castle that David Lindsay, 9th Earl of Crawford, died on 20th September 1558—his will, dated thence on the day of his death, being still extant.⁴ Doubtless owing to its remoteness the recorded history of the Castle appears to have been uneventful. After the slaughter of Lord Spynie by the Edzell Lindsays at Edinburgh, on 5th July 1607, Invermark became one of the lurking places of Lord Edzell's son, young David Lindsay, who had

¹ Vol. xi, p. 194.

² Vol. x, p. 100.

³ *Registrum Magni Sigilli*, 1510-80, No. 922; *ibid.*, 1580-93, No. 1579; *Registrum de Paumure*, vol. ii, p. 348.

⁴ Lord Crawford, *Lives of the Lindsays*, vol. I, p. 327.

been a prime instigator of the bloody deed.¹ In 1720 the York Buildings Company agent estimated the value of the "Castle of Innermark, of stone and slate roof," at £365, and reported that "repairs necessary thereto is one hundred and ninety pound twelve shilling, which it must have in all haste to prevent it going to ruine."² These repairs were doubtless made, as the Castle continued to be habitable until 1803, when it was gutted and the outbuildings were razed in order to provide materials for the new parish church and manse. The last regular occupants had been the factor for the York Buildings Company, who died there in 1745, and his two daughters, who until 1750 shared the old tower with the Rev. Robert Ker, minister of Lochlee.³

The Castle is now in good order. In 1898 the ivy was stripped from the walls, and in 1913 the whole building was carefully pointed.

I have to thank the Factor, Dalhousie Estates Ltd., for kindly granting facilities of access to the Castle.

¹ Lord Crawford, *Lives of the Lindsays*, vol. i. p. 387; see Pitcairn's *Criminal Trials*, vol. iii. pp. 61-5.

² *Rep. Pannure*, Appendix to Preface, p. civii.

³ Jervise, *op. cit.*, pp. 75, 133.

IV.

NOTE ON THE "SEAFIELD TALLY STICK."

By JOHN W. M. LONEY, F.S.A.Scot.

For many years there has been kept in the joiner's shop at Cullen House, in the county of Banff, what was thought to be an old measuring rod. As a curiosity it was sent here for identification. It was at once recognised as an Exchequer Tally Stick in a complete state of preservation (fig. 1), and as at present there are only a few such tally sticks in the National Museum, it is satisfactory to record



Fig. 1. The Seafield Tally Stick.

that, for its safe-keeping, the Trustees of Caroline, Countess of Seafield, have agreed to deposit this specimen as on loan from them.

The tally sticks in the Museum are: (1) an inscribed specimen dated 1778 and 1793, (2) another specimen of small size and apparently much older, without inscription, but of great interest, inasmuch as both duplicates are present, and (3) a good specimen recorded as having come from the Bombay Treasury Record Office, with a long inscription in Latin and of the time of King Charles II., and of interest as being a "right-hand" stick, a term of my own which I shall explain immediately.

The name "Tally Stick" is given to the notched sticks which, till the beginning of the nineteenth century, were used in *England* for keeping accounts in Exchequer, answering the double purpose of receipts and public records.¹ They are described as well-seasoned rods of hazel or willow, incised with notches on top (or bottom as required), which notches differed in breadth as standing for a penny, a shilling,

¹ *Chambers's Encyclopædia*, 1880, vol. ix. p. 280.

a pound, twenty pounds, a hundred pounds, and a thousand pounds, and on each side was written the name of the payer and the date of the transaction. The whole rod was apparently marked towards the ends on each side with a line of punctures, inside of which it was sawn across diagonally for half its breadth; thereafter the middle part of the rod was cleft vertically lengthwise through the centre, leaving the thickness at each end. This was done by means of knife and mallet so that, in rending the rod in twain, each piece became a tally stick, containing a half of every notch and one of the written sides. For practical purposes in reference and comparison I find it useful to describe the tally sticks so obtained as the "right-hand" and "left-hand" sticks respectively—the growth of the wood in the latter being from the root upward, and of the former downward—in both the written inscriptions fall to be read from left to right, but in the "right-hand" stick the notches must be read backwards, namely, from right to left. One stick was retained by the payer as his receipt, while the other was preserved in Exchequer, and further procedure in the transaction so recorded was not possible until the two sticks were produced and fitted together and identified as "*twin*" sticks.

This clumsy and cumbersome form of accounting derived its unknown origin in the days long before banking systems were brought into being, but none the less the practice was maintained in Exchequer procedure until little more than a century ago, and that notwithstanding an Act of George III. in 1783 decreeing its discontinuance.

Of the use of tally sticks in *Scotland* I have not found definite proof. It is stated that at the Union of the Parliaments of England and Scotland (when the Exchequer system of this country was drastically altered and revised) a store of hazel rods for tallies was sent to Edinburgh, but never used. On the other hand, Dr Maitland Thomson, in writing of Exchequer matters in Scotland,¹ asserts that "of Tallies, we hear nothing." Certain it is that the existence of the stock of unused tally rods to any extent is unknown at the Register House, where the unarranged and unindexed mass of Exchequer documents of earlier days were deposited after the Union, though there are quite a number of tally sticks there, which have been used, but I cannot say in Scotland.

There are two tally sticks on exhibition in the Royal Scottish Museum which were given as specimens by Mr James Oldham, London, in 1873. They are dated respectively 4th January 1819 and 3rd April 1819. The first is a "left-hand" stick and has not been well split, for its counterpart (the "right-hand" stick) must have tapered off to

¹ *The Public Records of Scotland*, 1922, p. 86.

a very fine edge. The core in the left-hand stick is only visible for about one-third of the length of the fissure. It is dated on the bottom, duly notched, and bears a Latin inscription. The second is of the same type as the first, better split, but again the counterpart must have been much thinner and lighter. It also is dated on the bottom, and notched and inscribed in like manner.

The dates of 1822 and 1823 on the Seafield Tally Stick, and on several of the other sticks I have seen, are after the date when their use was presumed to have been discontinued. This can be accounted for by the fact that, despite King George's order, tallies were used in the Exchequer up to as late as 1827 in giving receipts to accounting officers for interim payments on account.¹

Be that as it may, it is an historic fact that the use of tally sticks in any way had been discontinued prior to 1834, in which year the Exchequer collection of tally sticks was ordered to be destroyed, and the overheating of the stove within the precincts of the House of Lords, in which they were burned, caused the conflagration in which the old Houses of Parliament were destroyed.

It may, therefore, be assumed that the extant tally sticks are mostly, if not wholly, payers' duplicates, and that the Seafield specimen and the first of those already in the Museum, and those in the Royal Scottish Museum, are of this type. May a distinction be surmised between "left-hand" sticks retained by or given up to payers, and "right-hand" sticks, which from their lighter form and having to be read backwards (*i.e.* from right to left) may have been more conveniently retained in Exchequer? If, as is stated, the Bombay stick came from the Bombay Treasury Record Office (presumably an Exchequer Department) its "right-hand" type would support this suggestion.

The inscriptions on the Seafield specimen begin with a symbol or monogram which admits of various interpretations. The name of the payer is given as "Geo: Gnl. Ricketts Ar." (which seems to be a contraction for "Armiger," namely, Esquire). There follows: (1) the contraction "Rec. Gen^l," which may be read as Receiver General, and (2) "Assess. Tax 1822." At the end, the word "Hants," and underneath we find the date "28th Feby. 1823." Hampshire seems to be the *locus*, as "Midd^l." (that is Middlesex) is in the corresponding places on the specimens in the Royal Scottish Museum.

I have not identified the name of the payer beyond finding in the *Dictionary of National Biography* that Sir Henry Ricketts (1802-1886) of the Indian Civil Service is described as the third son of *George*

¹ *Palgrave's Dictionary of Political Economy*, vol. iii. p. 544a.

William Ricketts, and that Sir Henry was born at Lainston, near Winchester, which is in *Hampshire*.

On or near each group of notches there are written figures. On the assumption that each of the notches on the lower side represents £1000, these notches and figures may be interpreted as indicating the sum involved in the transaction to be £7388, 5s. 6d., which is presumably the amount of a collection of taxes made by an Exchequer official and duly accounted for to the Central Office in 1823, a date very near to that of the expiry of the usage of tally sticks.

For comparative purposes this specimen, in its perfect condition, may be regarded as a valuable addition to the National Museum.

MONDAY, 8th January 1934.

SIR GEORGE MACDONALD, K.C.B., LL.D., F.B.A.,
President, in the Chair.

A Ballot having been taken, the following were elected Fellows:—

JOHN C. BURNS, B.A., Assoc.M.Inst.C.E., 138 Newhaven Road, Edinburgh, B.
ALASDAIR FRASER, M.A., Raonmòr, Achiltibule, Garve, Ross-shire.
DAVID THOMAS SAMSON, D.L., Old Cullen, Cullen, Banffshire.
FREDERICK WISHART, 103 Great Western Road, Aberdeen.

The following Donations to the Museum were intimated, and thanks voted to the Donors:—

(1) By W. A. ORROCK, F.S.A.Scot.

Five Fob Seals of Silver and two of Steel.

(2) Mrs ALEXANDER HARVEY, Dyke.

Part of pointed object of Bone, of flat oval section, imperfect at the butt end, measuring $2\frac{1}{4}$ inches in length and $\frac{1}{2}$ inch in greatest breadth. Found by the donor on the land near her house at Dyke, Evie, Orkney.

(3) By W. LAIDLAW M'DOUGALL, F.S.A.Scot.

Stone Disc, slightly imperfect, measuring $2\frac{1}{4}$ inches in diameter and $\frac{1}{2}$ inch in thickness, found at Jarlshof, Shetland.

(4) By the Misses YOUNG of Burghhead, 7 Great Stuart Street, Edinburgh.

Symbol Stone of grey Sandstone, roughly rectangular, measuring 3 feet $11\frac{1}{2}$ inches in length, 1 foot $10\frac{1}{2}$ inches in width, and $8\frac{3}{8}$ inches in greatest thickness (fig. 1). On one side, near the top, is a bird—a swan or a goose—with head and neck bent backwards, the head, which looks towards the tail, resting on the middle of the back; below is the fish



Fig. 1. Symbol Stone from Easterton of Roseisle, Morayshire.

symbol. On the other side is a crescent with an oval indentation on the concave side, the crescent with V-shaped floriated rods symbol next it, and then the mirror symbol, and what looks like a comb with the teeth on one side only, opposite the handle to the left, these four symbols being placed upside down as compared with the bird and fish symbols on the other face. All the designs are incised. Part of one end of the slab seems to have been broken off, as a portion of the ring forming the end of the handle of the mirror is broken away. Found in 1894 on the farm of Easterton of Roseisle, Burghhead, Morayshire,

where it formed the western side of a cist-like structure. (See *The Reliquary*, 1925, p. 125, *Proceedings*, vol. xxix. p. 449, and *Early Christian Monuments*, part iii., p. 124, figs. 130 and 130a.)

(5) By THE MACKINTOSH OF MACKINTOSH, Moy Hall, Inverness-shire.

Symbol Stone of light red Sandstone, of rude oblong shape, measuring 3 feet 10½ inches in length, 2 feet 2¼ inches in breadth, and 7¼ inches in thickness (fig. 2). On one face



Fig. 2. Symbol Stone from Invereen, Inverness-shire.

are the spectacle ornament with Z-shaped floriated rods, the circles forming the so-called eyes being formed of three circles, the outer two being concentric and the inner one eccentric, as it is placed nearer the inner side; above is the crescent symbol with divergent floriated rods, and to its left a symbol consisting of a circle and an almost straight line running perpendicularly through and beneath its centre. As the stone is imperfect here it is not known if the line completely bisected the circle or started at the centre. Found at Invereen, Moy, Inverness-shire, in 1932.

(6) By ROBERT B. ROBERTSON, M.V.O., F.S.A.Scot.

Brass Pin, 2½ inches in length, the head formed by a brass cast of an early coin of Istrus showing two male faces side by side, the one on the right inverted.

(7) By Rev. D. G. BARRON, O.B.E., D.D., F.S.A.Scot.

Leather Shoe, found sticking up through the surface of the ground on the hill above Dale, Delting, Shetland.

(8) By JOHN R. FORTUNE, Corresponding Member.

Thirty-one Implements of grey and dark Flint, and one of brown colour, consisting of five arrow-heads, one barbed and stemmed, measuring 1½ inch by 1½ inch; two triangular, measuring 1½ inch by ¾ inch

and $1\frac{1}{8}$ inch by $\frac{1}{8}$ inch; and two leaf-shaped, wanting the point, measuring 1 inch by $\frac{5}{8}$ inch and $\frac{7}{8}$ inch by $\frac{1}{8}$ inch; two Triangular Tools, tranchet-shaped at base, measuring $1\frac{1}{4}$ inch by 1 inch and $1\frac{1}{8}$ inch by $\frac{1}{8}$ inch; ten Scrapers, measuring $2\frac{1}{4}$ inches by $1\frac{1}{4}$ inch, $1\frac{3}{8}$ inch by $1\frac{3}{8}$ inch, $1\frac{3}{8}$ inch by $1\frac{1}{8}$ inch, $1\frac{3}{8}$ inch by $1\frac{1}{8}$ inch, $1\frac{5}{8}$ inch by $1\frac{1}{8}$ inch, 1 inch by $\frac{1}{8}$ inch, $\frac{1}{8}$ inch by 1 inch, $\frac{7}{8}$ inch by $\frac{1}{8}$ inch, $\frac{1}{8}$ inch by $\frac{3}{4}$ inch, and $\frac{9}{16}$ inch by $\frac{1}{8}$ inch; two end Scrapers, measuring $1\frac{1}{2}$ inch by $1\frac{1}{8}$ inch and $1\frac{1}{2}$ inch by 1 inch; five Knives, measuring $1\frac{1}{4}$ inch, $1\frac{3}{8}$ inch, $1\frac{5}{8}$ inch, $1\frac{3}{4}$ inch, and $1\frac{1}{2}$ inch in length; and seven worked Flakes. Found by the donor on Airhouse, Oxtou, Berwickshire.

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By DAVID DAVIDSON, 47 Park Square, Leeds, the Author.

The Exodus of Israel, its Date and Historical Setting. Leeds, 1933.

(2) By HIS MAJESTY'S GOVERNMENT.

The Register of the Privy Council of Scotland. Third Series. Vol. xiv., A.D. 1689. Edinburgh, 1933.

Calendar of Entries in the Papal Registers relating to Great Britain and Ireland. Papal Letters. Vol. xii., A.D. 1458-1471. London, 1933.

Calendar of the Close Rolls. Henry VI. Vol. i., A.D. 1442-1449, London, 1933.

(3) By GILBERT ASKEW, F.S.A.Scot.

The Northumbrian Bag-pipes, their Development and their Makers. By William A. Cocks. Newcastle-upon-Tyne, 1933.

(4) By THE SCOTTISH COUNTRY DANCE SOCIETY, through Mrs STEWART, Hon. Secretary, 3 Park Circus, Ayr.

The Scottish Country Dance Book. Books i.-viii. 1932.

(5) By FRED T. MACLEOD, F.S.A.Scot., the Author.

The MacCrimmons of Skye, Hereditary Pipers to the Macleods of Dunvegan. Edinburgh, 1933.

(6) By JOHN A. STEWART, F.S.A.Scot., Joint-Author.

Inchmahome and the Lake of Menteith. Edinburgh, 1933.

(7) By THE SECRETARY, Manx Museum.

The Journal of the Manx Museum, vol. ii., No. 37, December 1933.

(8) By R. MURDOCH LAWRENCE, F.S.A.Scot.

William Kennedy: New Light on Aberdeen Historian. Aberdeen, 1933.

(9) By Sir GEORGE MACDONALD, K.C.B., LL.D., etc., President.

Neue Terra-Sigillata-Funde aus Hedderuheim. By H. Dragendorff.

Carnuntina. By Wilhelm Kubitschek.

Canstatt zur Römerzeit: neue Archäologische Forschungen und Funde. I. Teil. Stuttgart, 1921.

Funde aus der Hunnenzeit und ihre Ethnische Sonderung. By Andreas Alföldi. Budapest, 1932.

(10) By THOMAS SHEPPARD, M.Sc., F.S.A.Scot., the Author.

Hull Museum Publications, Nos. 178-181.

(11) By ROBERT DINWIDDIE, the Publisher.

The Gallovidian Annual, 1933. Dumfries, 1933.

The following Communications were read:—

I.

NOTES ON AN ARTIFICIAL MOUND AT BONNYBRIDGE.

BY SAMUEL SMITH, CORRESPONDING MEMBER, S.A.Scot.

This mound is situated, within what used to be the Barony of Seabegs, on land that now belongs to Messrs Smith & Wellstood, Ltd., ironfounders, Bonnybridge. It stands on the north side of the Antonine Ditch, about 130 yards west of the road that leads to Bonnybridge High Station, and is one of several apparently similar structures which are, or were once, to be seen on or near the line of the Roman Wall. The two others which survive are the Peel of Kirkintilloch and a well-preserved 'tunulus' near the Parish Church of Cadder.¹ A fourth was visible during the eighteenth century not far from Castlecary—'about a furlong east from the fort, near a house or two called *Booneck*'²—while a fifth, known as the Maiden Castle,³ was destroyed in 1894 during the building of Watling Lodge, a house a little to the west of 'Lock Sixteen' on the Forth and Clyde Canal.

The earlier writers were agreed in believing the Peel of Kirkintilloch to have been one of the original 'stations' on the Wall, but there was some difference of opinion regarding the remainder. At Bonnybridge, and also at Cadder, Horsley and Roy regarded the structure as an 'exploratory mount,' an integral element of the Roman defence, whereas Maitland was convinced that it was 'either a Scottish or Pictish tum-moid, or court-hill.'⁴ Before the end of the nineteenth century it had come to be generally recognised that the Peel of Kirkintilloch had been a medieval fortress of the motte-and-bailey type. But the age of the others and their purpose continued to be obscure until 1913, when Sir George Macdonald and Mr A. O. Curle dug a trench across the ditch of the Cadder tunulus, and obtained evidence which proved that, in that case at all events, Maitland had been right in holding that it was not the Romans who had been the builders.⁵

An opportunity to learn something about the Bonnybridge mound occurred last summer. An extension of the foundry is in contemplation, and to make room for this it was necessary to divert the road which had hitherto served the block of houses called Singer's Place. On

¹ Macdonald, *Roman Wall in Scotland*, 1934, pl. lviii, 2.

² Horsley, *Britannia Romana*, p. 171.

³ Macdonald, *op. cit.*, 1934, pl. lviii, 1.

⁴ *Hist. of Scot.*, vol. I, p. 174.

⁵ *Proceedings*, vol. xlix. (1914-15) pp. 108 ff.

hearing that the new road would have to be cut through the mound, the Rev. Thomas Miller of St Helen's communicated with Sir George Macdonald, who thought it desirable that an eye should be kept on the work while the road-making was in progress, in case anything of interest should emerge. As I was favourably situated for the purpose, Sir George asked me whether I would pay an occasional visit to the site. This I agreed to do, and the following notes are the result.

I have to thank the contractor, Mr T. N. Hunter, for willingly agreeing to let me come and go freely at any time. When it became

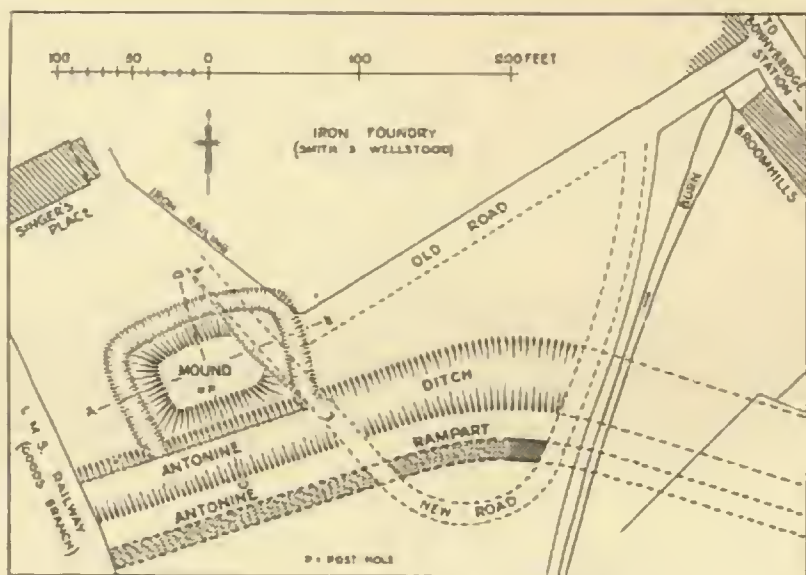


Fig. 1. An Artificial Mound at Bonnybridge: Plan.

clear that the information gained through his operations could be usefully supplemented by independent inquiry, permission for further digging was most readily granted by Mr Ure, the managing director of Smith & Wellstood, and also by the tenants in Singer's Place, on whose gardens it was sometimes necessary to encroach. Sir George Macdonald and Mr A. O. Curle, C.V.O., have visited the site from time to time, and have helped me with advice. The illustrations, which are based on my own plan and sections, have been drawn by Mr C. S. T. Calder.

It will be seen from the plan (fig. 1) that the line of the new road takes the shape of a very wide-mouthed letter U, and that soon after branching off from the old road it crosses the Antonine Ditch and Rampart, recrossing them again as it approaches the mound. To

prepare the formation bed, the whole of the turf had, of course, to be cleared away, and further excavation was sometimes required in order to provide an easy gradient, the depths of the cuttings varying with the irregularities of the natural surface. Where it was first crossed, the Ditch had been fully 50 feet wide, while the berm or space between it and the Rampart was 18 feet broad. The stone foundation of the latter, which was exposed on the west side of the road, had the normal width of 14 feet, and the material used for it here had been broken freestone, not natural boulders. The superstructure had almost entirely disappeared, but a few faint traces of lamination were observed immediately above the stones while the cutting was still fresh.

On the western half of the U the evidence regarding the Antonine Rampart was less satisfactory. Here the stone foundation had been torn up and was represented only by some small pieces of freestone scattered about on the surface. Its course, as entered on the plan, has been arrived at by assuming a uniform breadth of 18 feet for the berm. About the position of the Ditch, however, there is no manner of doubt. Its southern edge was clearly enough defined by a change in the character of the soil, and for purposes of verification a narrow trench was carried along the margin of the road. It was difficult to estimate its width, for the forced soil continued well into the cutting which was made into the east side of the mound by the contractor, the reason being that the road was now passing over the junction of the Antonine Ditch with a much narrower ditch which had surrounded the mound on east, north and west, and which it will be convenient to speak of in the sequel as the M. ditch. The inner edge of this was found by digging on both sides of the road at points which will be apparent from fig. 1. Its track, barely 16 feet wide, was distinctly marked on the formation bed of the road, as well as in the west side of the cutting where the two intersected one another farther north, the dark earth of the filling showing up very plainly between the masses of more lightly coloured soil on either side.

The position and direction of the cutting will be clear from the plan (fig. 1). Since it traversed the slope, it was naturally deeper at one side than at the other—7 feet on the west of the formation bed, as against only 1 foot 6 inches on the east, those being maximum measurements, taken opposite the middle or highest part of the mound, where the quantity of soil that had to be moved was greatest. While the section along EF was still perpendicular—that is, before it had been given the batter necessary for stability—and so long as it was still fresh, the conditions for observing the various kinds of soil displayed were favourable. Accordingly, at this stage the lines of demarcation were carefully noted

and measured and a drawing made (fig. 2). It must, however, be remembered that the section crosses the mound at an angle, so that its horizontal dimensions do not give a true conception of the width of the mound itself or of its ditch.

The dark line which can be seen stretching across the centre was obviously the residue of the vegetation that had covered the original surface. The fact that its mean level is a few feet higher than the level of the present surface round about proves that the mound has been

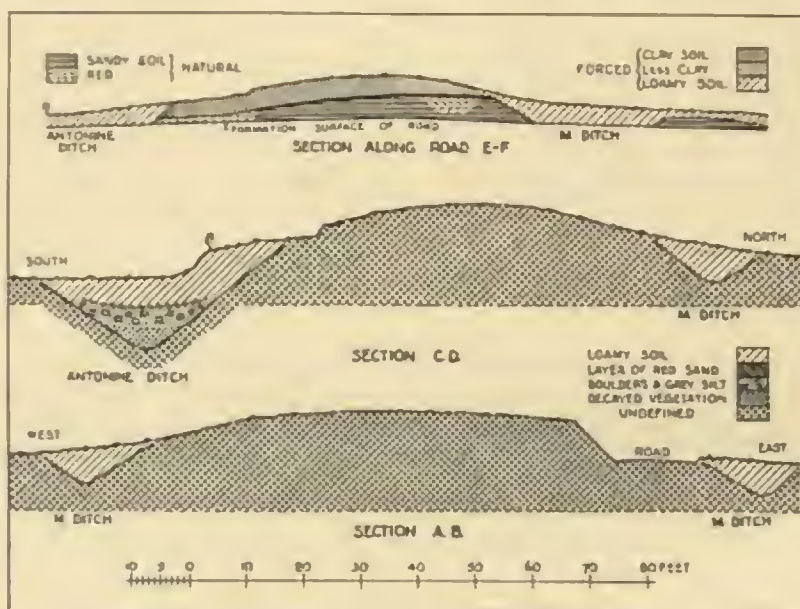


Fig. 2. An Artificial Mound at Bonnybridge: Sections.

reared on a slight natural elevation. Underneath the dark line, where horizontal hatching is used, the soil was natural, being sandy but firmly compacted, and containing an occasional boulder. Where the hatching is broken, the colour was red. Thus, the hovel-shaped patch of broken hatching on the right represents a vein of clean red soil, interspersed with numerous boulders. This vein was found to penetrate the mound and to extend beyond it, both towards the east and towards the west, in almost a straight line. It is an odd intrusion, but is in all probability natural. As it is under the dark line and as the two northern corners of the M. ditch have been cut through it, it certainly cannot represent a ditch dug for the defence of the mound. Above the dark line, where the hatching is perpendicular, the soil was more or less largely intermingled with clay. Doubtless this was part of the upheast thrown out

of the Antonine Ditch, and it will be observed that the farther one got from the edge of that Ditch, the thinner did the intermixture of clay become. The inclined hatching denotes soil of a rich loamy character, covering the M. ditch at the north end of the section, and spreading at the south end, not only over the Antonine Ditch, but also over the adjacent part of the M. ditch. It is reasonable to suppose that most of this soil has come from the mound and that a gradual process of denudation accounts for the greater amount of humus which it contains. Many boulders were met with in the course of the excavation, but I have no explanation to offer of their presence.

Besides the construction of the new road, the contract included the removal of a great quantity of soil from the area to the north-east of the mound, the object being to pave the way for the extension of the premises by reducing the level of the surface to that of the floors of the existing foundry-building. On the working-face of the excavation, which was as much as 8 feet deep and was close to the line marked 'iron railing' in fig. 1, the dark filling of the M. ditch could be readily distinguished. From the slice of it which was cut away to give a finishing touch to the slope at the side of the excavated area, there came a fragment of the rim of a vessel of light-coloured ware. It is unfortunately not possible to say at what depth the sherd had been lying, as it was picked up after the soil in which it was embedded had tumbled to the bottom of the cutting. But it had a very distinctive contour (fig. 3), and Mr Curle had no hesitation in dating it *circa* 1200 A.D.



Fig. 3. Section of Rim of Pottery Vessel. (f.)

Interesting as was the information which the contractor's work had yielded, it left a number of points unsettled, notably the shape of the M. ditch and its exact relation to the Antonine Ditch. With a view to getting further light upon these, a number of additional trenches were dug. It turned out that the M. ditch had had a width of about 17 feet, measured at a mean depth of fully a foot below the present surface. It had been 6 feet deep, and its shape had been that of an irregular V, the counterscarp descending at a sharper angle than the scarp.¹ In all the sections the filling was uniform, consisting of more or less loamy earth such as might have slipped down from the mound, and containing a very few scraps of pottery and pieces of iron slag, of

¹ See Sections AB and CD in fig. 2. In looking at these it must be borne in mind that the portions which have a diamond hatching, and which are described as 'undefined,' were not actually trenched. Only the ditches were opened up. In the case of the Antonine Ditch only the northern half was actually cleared, but the other half was presumably similar.

which something will be said later. The two northern corners were rounded, but the two southern ends, although they tended to converge, ran into the Antonine Ditch, each in a straight line, in a manner which left no doubt as to the Antonine Ditch having been there first (fig. 1). In a section near the north-west corner the bottom was filled with stones. As some gravel was observed outside the ditch here, on the west side at a depth of about 2 feet, it seems possible that the approach to the mound had been at this point.

The Antonine Ditch was sectioned directly opposite the mound, when it was found to be 42 feet wide and almost 12 feet deep. The difference in size is well brought out in the section CD (fig. 2), which also shows the difference in the character of the filling. The details of the latter deserve to be recorded. For a depth of $4\frac{1}{2}$ feet we cut through loamy soil, similar to that which had been found in the M. ditch. Then came a layer of red-coloured sand which varied in thickness. In our first trench (CD) it was 8 inches thick in the middle of the Ditch, but tapered away towards the north and disappeared before reaching the counterscarp.¹ Underneath the red layer was a layer of grey-coloured silty soil, about 3 feet deep, in which numerous large stones were embedded. Finally, below the silt was an accumulation of decayed vegetable matter, closely resembling peat. This accumulation, which had a maximum depth of $3\frac{1}{2}$ feet, contained some branches that had belonged to bushes of a sturdy growth. Varying in thickness from a mere twig to what may have been the main stem, $2\frac{1}{2}$ inches in diameter, the branches could be easily cut with the spade. When this was done, the wood looked fresh: but it rapidly turned black on exposure to the air.

Mr M. Y. Orr of the Royal Botanic Garden kindly examined the vegetable remains under the microscope. He reports that the branches were of willow. As he also found at least one willow-leaf in the peaty matter, it is safe to conclude that willow-trees had been growing in the Ditch when the silt was laid down. How they came to be buried, it would not be easy to say. If the silt is pure silt, then there must have been water in the Ditch when it was deposited. It did not appear to be stratified, but, if the stones embedded in it were thrown in when it was in a soft state, any stratification that existed would be destroyed. Is it possible that a dam has been made in the Ditch at some time? If so, the obstruction must have been where the new road now runs, for in trenches dug to the east of that line it was necessary to go much farther down before any trace of

¹ Three other trenches, dug later, proved that it had not been continuous all along the south face of the mound.

silt appeared.¹ The dam, if there was one, could hardly have been made for flooding the M. ditch, as the water would have escaped over the south lip of the Antonine Ditch.² Nor is there any means of knowing whether it was by accident or by design that the stones were in the silt. What is certain is that there has been a level of occupation above silt and stones, for on the top of them there were lying numerous fragments of bone—too minute to be identified—and several small pieces of pottery. A piece of iron slag came from the red layer. Higher up, the filling was exactly the same as that of the M. ditch. As the pottery, too, was similar in character, it follows that the mound had been occupied at a time when the Antonine Ditch was half-filled with decayed vegetable matter, silt and stones, its own ditch being meanwhile empty.

Regarding the composition of the mound itself there was not much to be learned. With a view, however, to verifying the source of the clayey stratum which appears in the section EF (fig. 2), a short trench was dug over the counterscarp of the Antonine Ditch a little way to the east of the new road. The result of the incision was to confirm the conjecture that the material had been thrown up by the Roman diggers. Clay was encountered at a depth of 5 feet, showing that there was a bed of this material through which the workmen would have to cut. It is worth adding that a trial pit sunk near the same spot but on the north side of the lip of the Ditch gave a depth of fully 3 feet for the upcast. That the clay bed continued for some distance farther west was proved by a trench dug on the top of the mound near its western end, where clay, similar to that which appears in section EF (fig. 2), was found at a depth of 18 inches. This last trench also revealed a post-hole, 2 feet deep, in the position marked in fig. 1. At the bottom were the stones that had served for packing the post, and among these was a piece of iron slag. Otherwise the hole was empty.

The manner in which the ends of the M. ditch tend to converge, as they approach the Antonine Ditch, almost suggests that the mound has been elliptical (fig. 1). But in the anonymous account of a journey made along the Roman Wall in 1697, preserved among the Portland Papers, it is described as "an heap of earth on the outside of the ditch of a square figure, about sixty feet long, forty broad, and twenty high; flat on the top."³ What Horsley says about it seems to bear out this view

¹ In one trench the silt was 10 feet below the present surface, which, however, is here 2½ feet higher than the present surface opposite the mound. The true difference in the level of the silt was, therefore, 2 feet 4 inches.

² Unless, indeed, the obstruction was carried all the way across the berm, in which case the remains of the Rampart might have formed the southern bank of the dam.

³ *Hist. MSS. Comm.: Portland Papers*, vol. II, p. 57.

of its shape. He calls it "a beautiful exploratory mound, not unlike that near *Calder* church."¹ As the *Cadder* tumulus, which is still in good preservation, is rectangular, we must assume that the *Bonnybridge* example was of similar form. Within the ditches it measures about 97 feet along the major axis and 65 feet along the minor. These figures are basal, and it will be noted that they agree in ratio with the measurements given by the anonymous traveller for the size of the top—60 feet by 40 feet. At present its summit is about 9 feet higher than the surface of the new road which skirts it on the east, and fully 13 feet higher than the surface of the field on the south. If the slope of the scarps of the ditches and the 'angle of repose' for the soil of the mound be taken into consideration, it will be seen that the original height of the mound may not have exceeded by more than a few feet the height it stands at to-day.

In the *Bonnybridge* mound, then, we have the essential features of a 'motte'—a heap of earth, surrounded by a defensive ditch—and the inference that it was a 'motte' is supported by the pottery fragment which Mr Curle dates to about 1200 A.D. In the excellent description of these 'mottes' which Mrs E. S. Armitage gave to the Society more than thirty years ago,² it is pointed out that they were the work of the Norman invaders. Quickly erected, and having attached to them a court-yard or 'bailey,' they were suitable in an age when vigilance and means of defence were alike necessary. In Galloway and the south-west they are often round or elliptical, but elsewhere in Scotland they are usually rectangular. Their weakness lay in the wooden structure that surmounted them. As this could be easily destroyed by fire, it was by and by superseded by the stone tower.

At *Bonnybridge* we can fortunately appeal, not only to analogy, but to documentary evidence. In 1891 the late Dr Christison collected from the Great Seal Register fifteen allusions to particular 'mottes' and seven to 'motehills.' Among these was one to "*lie mot de Seybeggis vocat. lie Turchill*,"³ Although Dr Christison does not say so, there cannot be the slightest doubt as to the identity of our mound with "the motte of Seabegs." The reference occurs in a charter of 15th March 1542/3, confirming a charter of fourteen years earlier, which recorded a transfer of the lands of Seabegs, with the right to select a

¹ *Britannia Romana*, p. 171.

² *Proceedings*, vol. xxxiv. (1899-1900), pp. 260 ff.

³ *Proceedings*, vol. xxv. (1890-91), pp. 210 ff. 'Turchill' is the form in which the alternative name appears in the *Registrum Magni Sigilli*. But the Rev. Mr Miller, who has examined the original, informs me that the true reading is 'Curthill,' i.e. Court-hill, implying that, after it had served its primary purpose, the mound had been put to another use. For examples of confusion between *c* and *t*, see *Proceedings*, vol. xxxix. (1904-5), p. 380.

priest for the Chapel of St Helen. The sasine was to be taken at "the motte of Senbegs, also called the C(o)urthill."¹ There is no other mound in the neighbourhood which could possibly answer to this description. The site of the Chapel of St Helen is on lower ground about 450 yards to the north. To-day the buildings that occupy it bear the name of Chapel Place, and General Roy calls the mound "the Chapel-hill." The 'motte' was perhaps selected as the scene of the ceremony of taking sasine because it was the original centre of the Barony.

It remains to say a word or two about the objects found. These were few in number and, for the most part, insignificant. By far the most important was fig. 3. which has already been dealt with. The rest of the pottery sherds were so fragmentary that Mr Curle hesitated to assign a very definite date to any of them, although their variety seemed to him to point to an occupation of some kind over a fairly long period. While several which came from the trenches cut to the east of the road can hardly be directly connected with the motte, they had an interest of another kind. Lying from 4½ to 5 feet below the modern surface, they suggested that this part of the Antonine Ditch had remained open to that depth until possibly as late as the eighteenth century. Mention has already been made of various lumps of iron slag which were found in the course of our excavations. Gordon remarks in his *Itinerarium Septentrionale*² that "Abundance of Iron and Lead Ore is dug up near this Hill, some of which I carried away with me, and, probably, the Romans, at this Place, might have had a Foundary for melting their Metal." That there must at some time have been a bloomery near the mound seems scarcely open to question. On the other hand, the position of the majority of the pieces which we obtained was such as to indicate that the smelting operations had been carried on in post-Roman days.³

Mr Uré was greatly interested in the discovery of iron slag, and had several samples analysed by the firm's expert chemist. At his suggestion two of the iron ingots from Newstead were similarly tested. As the ingots were in a more highly manufactured state, the iron content being as high as 98·2 per cent. in the one case and 99·05 per cent. in the other, a comparison with the Bonnybridge samples would hardly be relevant. But the metallic iron content of the latter was only 49·9 per cent., or actually less than that of some of the specimens

¹ A tradition of the uses to which the mound had been put lingered on until 1797. The *Statistical Account* says: "In the barony of Senbegs, near the canal, there is an artificial mound of earth, where courts and deliberative councils were formerly held, as appears by the name Mote, which the place yet retains" (vol. xix. p. 107).

² Page 57.

³ The only case in which there was even a shadow of doubt was that of the fragment at the bottom of the post-hole. But the date of the post-hole itself is quite uncertain.

of bog iron ores from Gairloch Parish, analysed by the late Dr Ivison Macadam.¹ The detailed analysis was—Ferrie Oxide 69·85 per cent., Silica 27·9 per cent., Manganese Oxide 1·35 per cent., Sulphur ·04 per cent., with a trace of Phosphoric Oxide and of Lime. A sample of the layer of red sand from the Antonine Ditch was also analysed. After deduction of 45·62 per cent. of moisture, the analysis of the dry sample was as follows—Silica 83·36 per cent., Alumina ·29 per cent., and Ferrie Oxide 17·11 per cent., with a trace of Lime.

II.

A MOUND CONTAINING SHORT CISTS AT TRUMLAND, ROUSAY, ORKNEY. BY THE LATE J. HEWAT CRAW, F.S.A.Scot.

In the summer of 1932 a denuded mound on the farm of Nears, Rousay, was excavated by Mr Walter G. Grant, F.S.A.Scot. Although in a very ruinous condition, the remains of a small short cist containing fragments of two steatite urns and a few incinerated human bones were found near the centre.² After the excavation of this structure, another was discovered in the adjoining field, but on Trumland Home Farm, 10 yards east of the dry-stone dyke which separates the holdings. It was decided to leave over for another year the examination of this monument, and so it was early in the following June (1933) that Mr Grant and I carried out the excavation.

This construction, which appeared as a low, grassy mound (fig. 1), lay 120 yards east by north of the first, at about the same elevation, 75 feet above sea-level. It was composed almost wholly of earth, with here and there slabs of stone appearing through the turf. Its original height was 4 feet 6 inches. Immediately within the perimeter was found a symmetrical wall of well-built slabs, laid on the flat in three to six courses and varying from 8 inches to 12 inches in height. The space enclosed was practically circular, measuring 20 feet 8 inches in diameter from north to south and 20 feet 10 inches from east to west. On the top of the mound, beneath 2 inches of turf, and with its centre 1 foot south-east of the middle of the monument, was a cist-like construction formed by three slabs, 1 foot 5 inches in length, 8 inches in breadth, and 7 inches in depth, the longer axis pointing 25° west of north magnetic (fig. 2, B). There was neither a cover-stone on the top nor a slab at the north end, both having probably been torn out.

¹ *Proceedings*, vol. xxi. (1886-7), p. 101.

² *Ibid.*, vol. lxvii. p. 24.



Fig. 1. Burial Mound at Trumland, Orkney.

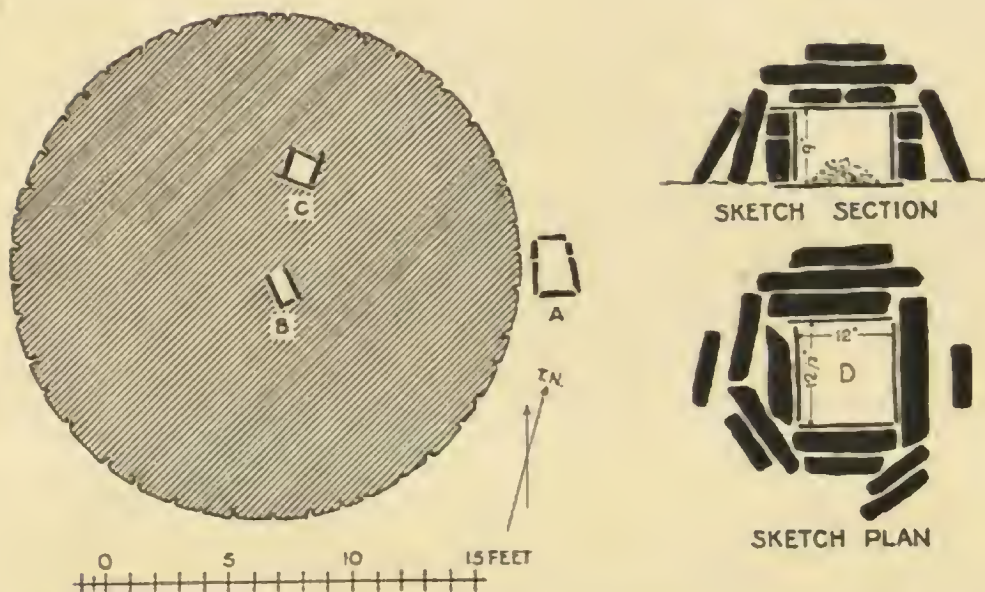


Fig. 2. Burial Mound at Trumland, Orkney: Plan; and Plan and Section of Primary Burial, Cist D.

The cist only contained soil. To the north of it, and half-way between it and the edge of the kerb, was a square cist with its axis lying 22° east of the north magnetic; it measured 1 foot 3 inches in length and breadth and 1 foot 4 inches in depth, and had a cover and a paving slab (fig. 2, C). It contained incinerated human bones, much burnt matter, and fragments of a steatite urn. Close to the outside of the south-east corner were fragments of the same urn and more burnt matter.

At a distance of 9 inches outside the kerb to the east was a third cist with its axis pointing north and parallel to the edge of the kerb (fig. 2, A); it measured 2 feet in length and 1 foot 6 inches in breadth. Each side consisted of two stones, and there was one at either end. The cover consisted of a thin slab, but the bottom was unpaved. The cist was 8 inches deep, but the side and end stones were only 3 inches deep, below them being an unlined excavation in the soil. This cist contained no bones or relics, but was completely filled with burnt matter similar to that in the second cist. From the peculiarity of the structure, position, and contents, it may have been used not for burial but for the reception of the products of a fire.

Almost exactly in the centre of the mound, and at a lower level than the first described grave, was another cist of striking symmetry and showing unusual structural features, with its axis lying north and south magnetic (fig. 2, D). It measured 12½ inches from north to south, 12 inches from east to west, and 9 inches in depth. The four side slabs and the cover were less than 1 inch in thickness. Against each of the four sides were placed two stones, one above the other, and around the whole were ten additional slabs laid to slope inwards towards the top. Over the cover were two stones, lying side by side, covered by a single larger stone, on the top of which was a smaller slab. It contained incinerated human bones, and one small fragment of pottery measuring about 1 inch by ½ inch.

The rest of the mound was dug over, but nothing further was found except several slabs of varying size which lay about the level of the top of the central cist, seemingly without any arrangement. After the mound was examined, the soil and turf and the stones of the first and fourth cists, which had been moved, were replaced, so that the structure remains in its original state.

III.

A CHAMBERED MOUND AT WESTNESS, ROUSAY, ORKNEY.

BY WALTER G. GRANT, F.S.A.Scot.

About the 100-foot contour line, on a slight shelf, on the fairly steep grassy slope between the house of Westness and the public road, some 25 yards distant from the latter and about 250 yards from the Bay of Westness on Eynhallow Sound, stands a grass-covered mound, measuring 40 feet in diameter from north to south and 35 feet from east to west. As the mound had been dug into a good many years ago, it is now reduced to a height of 3 feet, the excavated part having been partially refilled and left with a hollow on the top. On the east side of this hollow the upper edge of a long thin slab appeared, and at the northern end two stones laid on the flat, giving the appearance of steps. There is no record of the former excavation.

On the 3rd of July 1933, Dr Callander, Director of the National Museum of Antiquities, being present, the mound was again opened, in the hope that its character might be revealed.

A trial trench was driven in from the northern edge until structure was met with. This cut showed that the mound was an earthen one, containing a natural admixture of small stones. No traces of cairn-building were seen. When the centre was excavated an irregularly shaped sub-oval chamber was brought to light, the longer axis lying nearly north and south (fig. 1). It measured 8 feet 9 inches in length and 6 feet 11 inches in greatest breadth. The north-east corner of the building had evidently been completely torn out except for a small section which indicated the line of building. The west side of the chamber

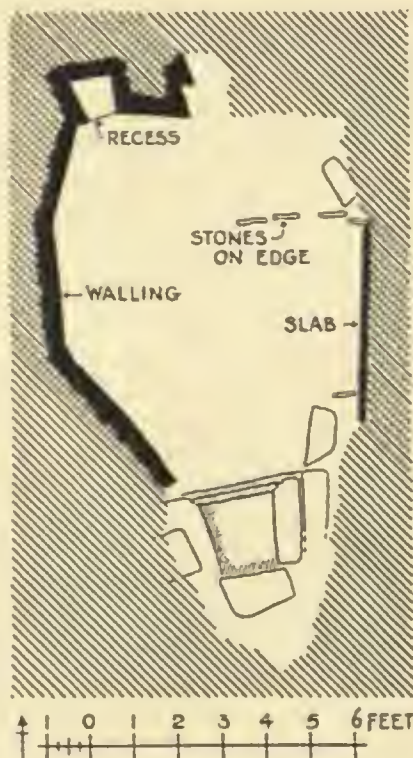


Fig. 1. Plan of Chambered Mound at Westness, Rousay.

and also the western half of its north end consist of a carefully built wall of stones, not set in a regular curve, but in short straight sections. The greater part of its east side is formed by a flagstone set on edge, measuring 4 feet 11 inches in length, 2 feet 1 inch in height, and $2\frac{1}{4}$ inches in thickness. At its northern end is the fragment of walling already referred to. This consists of three thin stones, now lying at an angle, but no doubt originally laid on the flat. The vacant space in the north-east corner between the end of this flag and the eastern end of the north wall which terminates in a vertical face, may have been filled with another slab on edge, this having been removed during the previous excavation. The south end of the east side beyond the flag is not aligned with it, but projects forward 12 inches and angles inwards. The corresponding building on the opposite side also converges, reducing the width of this end to 3 feet.

Inserted in the floor at the northern end of the upright flag on the east side, and at right angles to it, is a setting of four small flags, 1 inch to 2 inches thick, placed vertically, the three outer ones rising only 2 inches to 4 inches above the level of the floor. Near the opposite end of the flag is another small stone, also placed at right angles, possibly the remaining member of a setting similar to that at the other end. Whether there had been an outside kerb is not known, but the structure is strongly suggestive of a rectangular bed- or hearth-like arrangement, 4 feet long by 2 feet 9 inches broad.

Where the north end angles into the west wall is a small bole or recess, 6 inches from the floor, measuring 8 inches high, $7\frac{1}{2}$ inches broad, and $11\frac{1}{2}$ inches deep. In the east end of the chamber are the lower courses, one on each side and two at the back, of a recess, measuring 23 inches across the mouth, 16 inches across the back, and 19 inches deep.

There is no indication how the chamber was roofed, as the remaining parts of the sides are practically vertical, with no signs of inward corbelling, neither are there any indications of supporting pillars for a roof.

The only relics discovered consisted of a few fragments of burnt bones—evidently human, as small parts of a skull could be identified—and pieces of charcoal scattered here and there. The incinerated bones were mostly picked out of the filling in, but a few pieces were found on the floor, chiefly at the north-west corner, where the lowest floor-level had not been disturbed by the previous excavators.

There is some difficulty in determining the character of the monument. The small bole near the floor and the bed- or hearth-like setting are suggestive of a dwelling more than a tomb, but there are

no signs of a fire nor of an entrance. Besides, the diameter of the mound is too small to permit of the walls being carried to a height suitable for habitation. It has not to be forgotten, however, that in Orkney there are quite a number of small earth-houses with low roofs, but these are all provided with entrance passages. The presence of cremated human remains and scattered small fragments of charcoal could hardly be expected in a dwelling, and it would seem that the building was sepulchral and of a very unusual type.

Professor Alexander Low, F.S.A.Scot., who examined the bones, reported that they were very thoroughly incinerated, and that fragments of human parietal, occipital, ulna, and thigh-bone were identified.

On sloping ground on the farm of Westness, in a field which has been long under cultivation, about 230 yards north of Westness House and 70 feet west of the farm road, at an elevation of some 80 feet above sea-level, is a circular mound, doubtlessly lowered in height and spread out to a certain extent by agricultural operations, now measuring 56 feet in diameter and 4 feet in height. This, presumably, is another burial site.

IV.

A VIKING CIST-GRAVE AT BALLINABY, ISLAY. BY ARTHUR J. H. EDWARDS, F.S.A.Scot., ASSISTANT KEEPER OF THE MUSEUM. WITH A NOTE ON THE SKELETAL REMAINS BY PROFESSOR THOMAS H. BRYCE, M.D., F.R.S., F.S.A.Scot.

On the 24th June 1932 a Viking grave was found at Ballinaby by Mr Neill M'Lellan, shepherd, when effecting the release of a lamb which had squeezed through an opening between two of the stones on the north side of the structure. As he was freeing the lamb the shepherd saw an iron axe and some human bones lying inside on the surface of the sand, and suspecting a burial of some kind he had information of his find conveyed to the police authorities. Sergeant Duncan MacNair of the Argyll Constabulary visited the site and took temporary possession of the relics, making at the same time adequate arrangements for the protection of the grave until it could be examined by a representative from the Museum. I was not able to go there, however, until 10th July, when Sergeant MacNair gave me every assistance in making this record. It is to him that I am indebted for information as to the position of the skeletal remains and relics in the grave.

The burial was situated on a natural shelf near the top of a rocky knoll now covered with sand and overgrown with grass, about half a mile west of Ballinaby House, and about 400 yards west of the graves of a Viking man and woman of tenth-century date, discovered by the father of Mr Neill M'Lellan in 1878.¹ These burials had been made side by side, each surrounded by a line of stones set on edge, but the structure of the present find was that of a cist-grave, the long axis of which lay 65° east of north magnetic or nearly north-east and south-west. The grave was formed of four slabs set on edge on the north side (fig. 1), four on the south side, and four cover stones supported by those on the sides. There were no end slabs, but as a number of loose and broken stones, of a nature and appearance similar to those of which the grave was made, were lying about on the slope on the north side, it is very probable that end slabs had existed originally. Below the sand which partially filled the interior was the floor of natural rock. The slabs were of chloritic schist and varied from 3 inches to 6 inches in thickness. As can be seen in the illustration there are spaces between the slabs, but these vacancies were in all likelihood filled at one time by

¹ *Proceedings*, vol. xiv, p. 51.

other stones. The grave lay about 1 foot 6 inches below the surface and measured internally about 7 feet in length, 2 feet in breadth at the west end, 2 feet 6 inches near the centre, and 1 foot 10 inches at the east end, the depth being 1 foot 9 inches. Although many of the bones of the skeleton were missing, it was possible to ascertain from what remained that the body had been laid fully extended with the head at the south-west end.

The relics consisted of an axe which was found on the left side of



Fig. 1. Viking Cist-grave at Ballinaby, Islay.

the skeleton just about the position of where the right elbow would have been, a sword found on the right side with the hilt near the waist, the boss of a shield also on the right side and opposite the breast, and fragments of a sickle or knife which were so disintegrated as to make their exact identification uncertain. All these objects were of iron. In addition, a buckle and a free ring-headed pin of bronze were found near the centre of the body. The axe (fig. 2, No. 1), which has suffered a good deal from corrosion, measures 8 inches in length and $5\frac{1}{2}$ inches across the cutting edge. It is similar in type¹ to those we already have in the Museum from Reny, in Caithness and Kiloran Bay, Colonsay. The sword (fig. 2, No. 2) is now in four pieces through decay, and a small portion near the point is wanting.

¹ *Proceedings*, vol. lxi. p. 204.

It is double-edged and measures 39 inches in length approximately. The blade is $2\frac{1}{2}$ inches in width immediately below the guard, tapering to $2\frac{1}{2}$ inches in the middle and $1\frac{3}{8}$ inch at a distance of 6 inches from the point. The slightly upwardly curved crosspiece of the pommel measures $3\frac{1}{2}$ inches in length, and the guard, which is curved downwards a little, $3\frac{3}{8}$ inches. There is no pommel stud now, but this may well have got detached and become completely disintegrated. The grip



OBJECTS NOT TO SCALE.

Fig. 2. Objects from Viking Grave at Ballinaby, Islay.

is $3\frac{1}{2}$ inches in length, and traces of wood still adhere to its surface. The exact type of the sword is difficult to determine, but it probably dates to about A.D. 950 or 1000. The shield boss (fig. 2, No. 3) is of hemispherical form, and measures $2\frac{1}{2}$ inches in height and 6 inches in diameter including the flange which is $\frac{1}{2}$ inch in breadth. Remains of the four rivets by means of which it was fixed to a wooden shield can still be seen, and portions of the wood itself are still attached to the underside. It is analogous to one from Reay and two from Orkney now in the Museum.¹ The pin (fig. 2, No. 4) is of the free ring-headed type, the ring-head measuring 1 inch in diameter and the stem 4 inches in length, the lower part being flattened for $1\frac{1}{2}$ inch from the point.

¹ *Proceedings*, vol. lxi, p. 201.

The buckle (fig. 2, No. 5) consists of a bow and tongue with a doubled plate for attachment to the strap, the latter measuring $1\frac{1}{2}$ inch in length, $1\frac{1}{8}$ inch in breadth at the wide end, and tapering to $\frac{3}{8}$ inch at the narrow end. The bow measures 2 inches in breadth by $\frac{3}{4}$ inch in depth, and is decorated on its upper surface by a pellet decoration in relief. This is divided into two panels by a space on which the tongue rests; the whole has been gilded. The tongue is zoomorphic in character and has been silvered.

Although the relics are in no way remarkable they date the burial to somewhere between A.D. 950 and 1000. This form of grave, however, is unusual. It has been recorded that Viking graves have been found within roughly made enclosures or settings of stones, but in Scotland the Viking cist-grave is uncommon, and according to Brøgger¹ the people who favoured this particular style of interment were probably immigrants from the coasts of Møre-Trondelag and Nordland in Norway, where quite a number of such graves have been found, and where the tradition of the Early Iron Age was preserved into Viking times.

The Society is much indebted to Mr Angus M'Lachlan of Loch Gorm House, Bruichladdich, Islay, who has kindly presented the relics to the National Museum of Antiquities.

REPORT ON THE BONES. By Professor THOMAS H. BRYCE,
M.D., F.R.S., F.S.A.Scot.

The skeleton from Ballinaby is unfortunately very fragmentary, all the bones having suffered seriously from post-mortem decay. The trunk is represented by the axis vertebra and various small fragments from other parts of the vertebral column. The ribs are all absent. There are only one or two small pieces of the pelvis, and no portions of either clavicles or scapulae. The long bones of the limbs present have all lost their extremities and parts of their shafts; they are therefore not measurable with exactitude. The left femur, however, when compared with a series of complete bones, was found to correspond closely with one measuring 474 mm. This figure indicates a stature of about 5 feet 7 inches. There is no special flattening of the femoral shafts below the trochanters, nor is there any lateral compression of the tibiae. Some fragments of metatarsal bones alone represent the skeleton of hands and feet. One of the metatarsals still has its proximal articular surface intact. The epiphysis is fully united.

The skull is represented by the vault, the base and face being absent. Even the vault is very defective, as most of the left side has

¹ Brøgger, *Ancient Emigrants*, pp. 121 and 122.

been destroyed. The glabella is flat and the supraciliary ridges are slightly developed; the superior orbital ridges are thin. All these are features pointing to the skull having been that of a woman, but the frontal bone is so much inclined backwards that it would rather appear that we have to do with the skull of a man. The condition of the sutures indicates, however, that the individual was far advanced in life, and it is just possible that the backward inclination of the frontal bone is due to old age changes in the skull bones.

No accurate measurements of the skull could be obtained save the maximum length. This is 194 mm., a figure which brings the specimen into the category of long skulls. From the characters of the vault there is no doubt that the transverse diameter was relatively small in relation to the maximum length, and that the skull, if whole, would have fallen into the dolicho-cranial class, or possibly into the lower range of the meso- or brachy-cranial category.

The jaw fragment indicates a moderately stout mandible with a well-marked chin. It might just as well have been that of a woman as of a man.

Three teeth have been preserved, a lower molar and two premolars. The crowns of the latter are worn quite flat, and the crown of the molar is worn down almost to the root. It is occupied by a large cavity possibly due to caries, an unusual feature in teeth of prehistoric times.

These dental characters, of course, support the conclusion drawn from the condition of the skull, that the individual was advanced in years.

V.

CINERARY URNS AT MONKLAW, JEDBURGH. BY ARTHUR J. H. EDWARDS, F.S.A.Scot., ASSISTANT KEEPER OF THE MUSEUM. WITH A REPORT ON THE INCINERATED CONTENTS BY PROFESSOR J. C. BRASH.

Two urns were found in a field 500 feet above sea-level on the farm of Monklaw, about two miles north of Jedburgh, and about 300 yards north-west of the house, when ploughing was going on during December last.



Fig. 1. Cinerary Urn found at Monklaw, Jedburgh.

The urns lay about 36 feet apart and both had been inverted. Of one there remained only the base and a few wall fragments; this must have been a very large vessel as the base measures $6\frac{1}{2}$ inches in diameter and 1 inch in thickness. Of the other, which contained cremated bones, the greater part though badly damaged was recovered, and it has been found possible to reconstruct it in the Museum. This urn is of a reddish-brown

colour and has an overhanging rim with a straight upright neck beneath. The wall portion is rather short, giving the urn a somewhat squat appearance. The vessel (fig. 1) measures $9\frac{7}{8}$ inches in height, from $7\frac{1}{2}$ inches to $8\frac{1}{4}$ inches in diameter at the mouth, $8\frac{3}{8}$ inches at the neck, and $4\frac{1}{8}$ inches across the base. The lip, which is slightly concave and bevelled downwards in the interior, is decorated by a zigzag pattern, and the broad overhanging rim by a lattice design bordered at the top by four horizontal lines and at the bottom by two. The neck is ornamented with similar markings, but round the lower margin is a row of small loops, the curvature upwards. The whole of the decoration has been formed by the impression of a twisted cord, the lattice patterns and zigzags being doubled.

The Marquess of Lothian has generously presented the urn to the National Museum, and we also have to thank Mr T. Wight, the farmer, for so carefully preserving what remained of the vessels and their contents.

REPORT ON INCINERATED BONES FROM BRONZE AGE URN.

MONKLAW, JEDBURGH. By Professor J. C. BRASH.

These remains, the incineration of which is incomplete, include more or less distorted but recognisable fragments of most portions of the skeleton: the bodies (centra) of thirteen thoracico-lumbar vertebrae are fairly complete.

The vertebrae are small and the portions of limb bones rather slender: but there are no recognisable epiphyses, nor any signs of recent epiphysial union at the upper ends of right humerus and right radius, the only parts complete enough for such an observation. A portion of the sagittal (interparietal) suture is recognisable, and shows internal union well advanced.

If asked for a diagnosis of sex, I would be inclined to suggest from certain minor indications on portions of the pelvic bones that the probability is female: but the most that one can say with any confidence is that these are the bones of a mature adult of slender build, probably below average stature.

VI.

STONE CIRCLES: A NEW THEORY OF THE ERECTION OF THE MONOLITHS. BY H. E. KILBRIDE-JONES, F.S.A.Scot.

It is now apparent that our prehistoric ancestors could very well think for themselves, and were not merely a race of barbarians living under clouded skies. On the other hand, our ancestors were just as active in mind as ourselves. It is true that they lived in small round huts when they might have built themselves palaces of stone or of brick; but that is no indication of mental inferiority. A people can be easily ridiculed when no tangible evidence remains regarding their powers of penetration and thought, their æsthetics, mental development, and religious ideals. Very often culture centres round religion; and religious ideals usually demand a certain initiative that might otherwise remain latent in the population. It often implies invention.

Any primitive race of people can easily erect a circle of rough boulders—very little talent is required for that: but when we observe that the monoliths have been split off from the living rock by the hand of man, and thereafter shaped, however roughly, to a definite and predetermined form, that implies invention. It implies, too, that these people who were responsible for shaping the monoliths were moving along a definite line of development to an ideal, now termed civilisation; because it is only when ingenuity, both individual and collective, is encouraged to serve humanity that the modern state develops. It spells organised society, and public recognition of genius in the individual.¹

The theory about to be propounded is well known amongst modern engineers; but it was unknown before that the same theory also formed part of the equipment of the engineers who erected the Stone Circles in Scotland, and of those who erected Stonehenge in England. The modern engineer is careful to adopt the easiest method of raising a mass or a structure into position, as there is such a thing as overhead charges to be taken into consideration: the Bronze Age engineer was equally careful, although not, possibly, from a similar consideration.

¹ Whether stone circles were merely sepulchral, a permanent memorial to a famous man, or places of worship matters very little for present considerations. It is unity of purpose which led to their gradual development. However, it is questionable whether the big stone technique be a mere accidental convenience or not (*cf.* T. D. Kendrick, *The Age Age*, chap. iv.). On the other hand, it seems to be the result, not of a spontaneity of conception, but of a deliberate and preconceived ideal, following a definite line of development.

Confronted by an enormous mass of stone, it was his place to contrive to discover the easiest methods whereby it might be raised into position; thereupon he either invented or developed the theory that is so well known to-day. I was fortunate in being present throughout the excavations undertaken by Professor V. Gordon Childe at the Stone Circle at Old Keig; and it was while I was watching the monolith Pm (fig. 1) being cleared of the earth that covered it, that its hitherto indeterminate shape suddenly conveyed a meaning the moment the base was fully exposed. The remaining monoliths displayed exactly the same characteristics.



Fig. 1. Old Keig Stone Circle: Stone Pm.
(Arrows indicate dressing.)

Most authors have been attracted to the problem of the erection of monoliths. Fergusson,¹ drawing a complete blank amidst a medley of useless data, dismisses the problem as "child's play." That, of course, is the most convenient method of attempting to solve any problem that is likely to prove too baffling. Peet dismisses the subject in one short sentence, without, however, even hinting at a method.² Later writers have been more thorough, and have attempted to explain away the problem in the crudest manner,³ due to a belief in a supposed absence of intelligence on the part of prehistoric man, who has been credited with employing the most difficult and cumbersome methods to achieve his ends. In all cases these conclusions are the result of inattention to the form of the monolith, a matter which should be carefully studied prior to the form of the crater in which it has been placed.

¹ J. Fergusson, *Rude Stone Monuments*, p. 95.

² T. E. Peet, *Rough Stone Monuments and their Builders*, p. 9.

³ Their theories will be referred to later, under the subheading "Stonehenge."

In regard to the monolith itself, the ideal form and mode of erection were probably due to insular ingenuity, and owed nothing to foreign influence.¹ Moreover, it shows that the Bronze Age peoples of these islands were as well acquainted with scientific engineering principles as were the Ancient Egyptians.

OBSERVATIONS AND MEASUREMENTS ON THE MONOLITHS
AT OLD KEIG.

Stone Pe.² East Flanking Stone.—This monolith is the tallest of the three examples chosen for the present paper; and it is the only stone remaining undisturbed in its original position (figs. No. 2 and No. 4, 1). It is an imposing monolith, standing 5 feet 11 inches above the turf level, and in extreme length from base to apex 9 feet. The maximum breadth is 4 feet 9 inches, and the thicknesses are as follows (reading from the base to the apex):—

		On curve (E. side).	On straight (W. side).
At 1 foot	. . .	12½ inches	13 inches
2 feet	. . .	12½ ..	12½ ..
3 ..	. . .	13 ..	10 ..
4 ..	. . .	11½ ..	20½ ..
5 ..	. . .	11½ ..	20½ ..
6 ..	. . .	12½ ..	21 ..
7 ..	. . .	13½ ..	23 ..
8 ..	. . .	14 ..	20½ ..
9 ..	. . .	15 ..	20 ..

The greatest mass is, therefore, concentrated immediately above the pointed base. The stone has been quarried, and is comparatively smooth on both faces. Its evenness is at once apparent from the above figures. The form of the stone is not accidental: it has been carefully split to the required shape. The straight (west) side of the monolith would appear to have been trimmed by being roughly hammered, perhaps with a stone maul.³ The curved side has been treated in the same manner. As far as it was possible to ascertain, the comparatively straight base seems to be the result of a single fracture.

¹ There seems to be little justification for assuming that the great stone monuments of the West were the result of a developed "Colonial" style (see Peake and Fleure, *The Way of the Sea*, p. 30); still less that the idea of the circle of stones was derived from chambered round barrows in Scandinavia (*ibid.*, p. 118). Since stone circles are more numerous in these islands than elsewhere in Europe (N. Gordon Childe, *The Dawn of European Civilisation*, p. 275), and since they are younger than most other megalithic monuments, it is probable that the Scottish, and perhaps the English, circles were an insular development. This theory has been dealt with by J. Graham Callander, *Archæologia*, vol. lxxvii, pp. 40-7.

² The notations used here correspond with those on the plan (to be published subsequently) prepared by Professor Childe.

³ Stone mauls were used extensively to trim the trilithons at Stonehenge. Here the surfaces were dressed with rounded hammer stones of sarsen (see Frank Stevens, *Stonehenge To-day and Yesterday*, pp. 38 and 39).

The monolith has been maintained in its present position by three small blocks; and other stones were carefully rammed in around all sides of the base. The form and size of the cutting made into the virgin soil to receive the stone is worthy of note (see fig. 4, 1). Also, the three packing blocks just referred to are resting immediately upon the virgin soil, thus guarding against any risk of subsidence.



Fig. 2. Old Kelg Stone Circle: East Flanking Stone Pe.

Stone Pm.—Although not so large as the above monolith, this stone is the finest example of the three (figs. No. 1 and No. 4, 3). It was found completely buried just without the outer limit of the bank. Its total length is 7 feet 7 inches, and maximum breadth 3 feet 8½ inches. The feature most worthy of note is its extraordinarily well-defined outline and form. More care than is usual has been expended on trimming it. It is of fairly even thickness, with the greater mass concentrated on the base, and on the straight side immediately above the

pointed base, as before. The four sides of the stone are comparatively straight, and its surface even; but the most remarkable feature is the careful tooling along the base (fig. 1), positive proof that the peculiar shape of the base was intentional, the result of a preconceived idea and plan, and not merely accidental.¹ The stone is a very regular trapezium. Its thicknesses are as follows (reading from base to apex):—

		On curve.		On straight.
At 1 foot	. . .	9½ inches	. . .	7½ inches
2 feet	. . .	8½ ..	. . .	8½ ..
3 ..	. . .	9 ..	. . .	9½ ..
4 ..	. . .	8½ ..	. . .	8½ ..
5 ..	. . .	6 ..	. . .	8 ..
6 ..	. . .	5½ ..	. . .	8½ ..
7 ..	. . .	6½ ..	. . .	7 ..

Stone Px.—This stone is, perhaps, the rudest of the three, yet it bears all the characteristics of the other two. It had been used as the



Fig. 3. Old Keig Stone Circle: Stone Px.
(Arrows indicate dressing.)

foundation of a dyke, and is undamaged. It is very irregular in shape, but, as seen from figs. No. 3 and No. 4, 2, it has been very roughly hammered into the standard form, and there is little difficulty in perceiving where the stone has been knocked away by the character of the irregular edges. The total length of the monolith is 8 feet 6 inches,

¹ This tooling seems to have been accomplished with a metal tool. This was probably of bronze, although copper might have been used. The use of copper is not so improbable as a first consideration might seem to suggest, since the Egyptians of the New Kingdom had nothing better, or more durable, than chisels of copper (cf. Somers Clarke and R. Engelbach, *Ancient Egyptian Masonry*, fig. 263). When an alloy such as tin is present, copper can be brought to a temper not far short of mild steel (*ibid.*, p. 25). Moreover, chisels were not unknown in Scotland during the Bronze Age, as the examples in the National Museum of Antiquities clearly demonstrate. The stones were probably trimmed at the quarry-face.

and the maximum breadth 3 feet 7 inches. Its thicknesses are as follows (reading from apex to base):—

		On curve.		On straight.
At 1 foot	. . .	13 inches	. . .	11 inches
2 feet	. . .	14	..	10
3 ..	. . .	11½	..	9½
4 ..	. . .	10½	..	11
5 ..	. . .	9½	..	12
6 ..	. . .	10½	..	14½
7 ..	. . .	10	..	12½
8 ..	. . .	10½	..	12

We thus observe that, although the monolith has been but roughly trimmed, the greater mass is still concentrated above the pointed base.

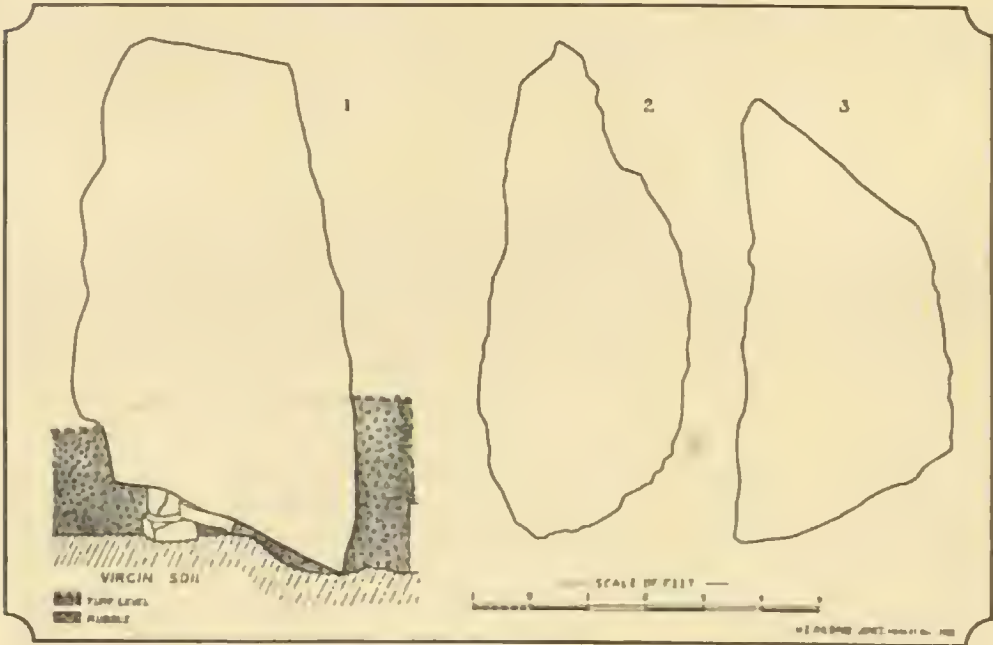


Fig. 4. Outlines of East Flanking Stone Pe and Stones Px and Pm.
(The numerous packing stones round Pe have been omitted.)

THE THEORY AS APPLIED TO THE ERECTION OF THE MONOLITHS.

The prehistoric stone circles of Great Britain have been described as being formed of simple unhewn blocks of stone.¹ Mindful of the stones at Old Keig, that statement appears to be quite erroneous when

¹ J. Fergusson, *Rude Stone Monuments*, p. 2. Also E. Herbert Stone, *The Stones of Stonehenge*, p. 31. The present paper proves the general idea to be ill-founded.

applied to stone circles collectively. Admittedly, there are circles composed of very rough stones: but many of the circles in Aberdeen, for example, show that a certain amount of care has been devoted to planning and shaping the monoliths, even to the extent of chiselling. The very evenness of some of the stones cannot be natural to them, and certain protuberances must, perforce, have been knocked off to give a rough uniformity of thickness, and this was probably accomplished with a stone maul. However, it must be admitted that careful trimming, such as that displayed on the base of Stone Pm, is the exception rather than the rule; but it does exist, as we have seen. In



Fig. 5. Castle Fraser Stone Circle: Recumbent Stone, with Flankers.

the majority of circles the stones appear to have been roughly pounded into shape, although an exception here would seem to be the Stone Circle at Castle Fraser (fig. 5). The east flanking stone, in particular, is very even and smooth, and its outlines almost straight; and with the amount of care expended on its appearance it stands in marked contrast to the somewhat irregular monolith forming the west flanking stone.

To the casual observer, perhaps one of the most curious and remarkable features of many stone circles is the pointed appearance of the majority of the monoliths, where large stones have been utilised: and it is further noted that this apex is never immediately above the centre of the stone, but, instead, it is reminiscent of a right-angled triangle whose apex is in line with one of the vertical sides of the stone. This feature is particularly noticeable in the case of Stone Pm at Old Keig, and also in the case of the flanking stones at the circle at Castle Fraser.

Since this feature is noticeable in nearly every stone circle where large stones have been employed, it cannot have been merely accidental, and it must, therefore, possess some significance.¹ Actually, the object in so shaping the stone was a very real one, and is in accordance with certain engineering principles which will be touched upon later. Briefly, the whole scheme was originated to lessen the effort, or thrust, necessary for the erection of the monolith.

The excavations at Old Keig revealed the interesting fact that this pointed apex was vertically above a similar point at the base, although the latter is not so pronounced, generally speaking.² It was discovered that, in all cases, the bases had been thus shaped. On a first consideration, this might seem to be an undesirable feature, detracting from the stability of the monolith, especially when stability plays such a large factor in the lasting qualities of the monument. Knowing that stability would not be sacrificed without some other really important object in view, there was nothing left but to conclude that the peculiar shape of the base was intimately connected with the erection of the monolith, as indeed it was. The east flanking Stone Pc provided the solution. When the stone was fully exposed, the methods employed in its erection were at once obvious.

The whole process of erection may be described by taking Stone Pm as the monolith to be raised, each step in the process being considered separately.

The various stages in the erection would be as follows:—

(1) The monolith would be levered up on to its shorter side (fig. 7), termed previously in this paper "the curve."

(2) An excavation would thereupon be made in the ground to receive the pointed base, and of sufficient length and width to receive the stone comfortably.³ It is interesting to observe the shape of this excavation. From fig. 4, 1, we observe that it must have been triangular in section, since it was only at the end intended to receive the pointed base that any cutting had been made into the virgin soil.

(3) After the completion of the excavation, the stone would be rolled into an upright position, using point C (fig. 7) as the fulcrum. To bring the stone to an upright position, a thrust would be applied as near to the apex as possible, and preferably at right angles to the line CD

¹ The Stone Circles at Callanish and at Stenness possess stones with apices pointed in the manner described.

² The same feature was observed at the Stone Circle at Castle Fraser, where two fallen pillar stones display the same pointed apex and base, after the manner of those at Old Keig.

³ It is, of course, a debatable point as to whether the excavation was made at this stage or prior to the arrival of the stone. The former course seems to be the more probable, as this would obviate any damage to the sides of the excavation due to the monolith getting out of control, or due to people trampling around whilst moving it into position.

to be most effective. This thrust is represented by the force P in fig. 7.

This last step is the most important in the whole procedure. At the moment of applying the thrust we see, from Mr Regnault's figures, that the force P required to raise the monolith is 1.575 tons (assuming the monolith to be of even thickness, and that its weight is 5 tons). As the stone rises into position, the thrust necessary decreases very rapidly, until, after an angle of 48° has been turned, the thrust becomes zero and the stone balances. This condition is due to the centre of gravity E having turned through an angle of 48° , until it is vertically above the fulcrum C. Thereafter, during the time the stone is turned through the remaining 42° , a restraining force will be required to prevent the stone from pitching forward. This restraining force would take the form of a rope, or ropes, fastened round the apex.

(4) Having raised the stone to an upright position, it now became necessary to wedge it firmly to make it secure for all time. First, the monolith was levered up slightly, and an excavation made in the humus to receive a number of wedges. In the case of the east flanking pillar Pe, the wedges were three in number, and they rested upon the virgin soil, to assure a sound foundation for them. The stone was then allowed to fall gently back upon the wedges, and, if correctly placed, the monolith should balance perfectly. Small stones and earth would then be rammed in between the monolith and the sides of the excavation, and the stone would thereafter be definitely secure.

During the process of raising the monolith, some means would be required to prevent it from pitching sideways. This may have been accomplished by driving a number of saplings vertically into the ground alongside the excavation: thus a temporary wooden buttress would be formed, which would keep the monolith from falling over whilst it was being made stable.¹

Had the monolith been a symmetrical one, and presuming it to have been raised from a horizontal position, instead of having been placed on its side as our present theory demands, the conditions and the thrust required to raise it would have been very different. The centre of gravity would have been midway between the base and the top, and, at the moment of raising, a thrust equal to $2\frac{1}{2}$ tons would have been required. Moreover, it would have been necessary to apply a slowly decreasing thrust almost throughout an angle of 90° , instead of a rapidly

¹ This theory is fully considered later in the present paper under the subheading "Stone-henge." There was, however, no evidence to support this assumption at Old Kelg; but the saplings may never have been driven into the virgin soil, and thus no evidence of a post-hole would remain.

decreasing thrust through an angle of 48° , which is all our new theory demands. Again, we see that, not only is there a saving of nearly 1 ton in the value of the thrust, utilising our method of erecting the stone, but the amount of work done is all but halved. The incongruity of asserting that the monoliths in stone circles were erected either from the interior, or exterior, of the circle is at once obvious. In any case, a cursory glance at the two flanking stones at the circle at Castle Fraser clearly demonstrates that they were never thus erected; for we observe that the west pillar is situated slightly behind the recumbent stone, whilst the east pillar is slightly in front of it.

Having ascertained the manner in which the monoliths were really erected, we can now understand the reason for adopting this peculiar standardised form. With a base of the form of the monoliths at Old Keig, the fulcrum C is brought nearer to the centre of gravity E, thus lessening the angle through which the stone would have to turn before the force P became zero. This enables the mass of stone to the left of the perpendicular CH (fig. 7) to give a pull in a downward direction, thus considerably lessening the necessary thrust. Another important factor in lessening the angle through which the stone must turn is the placing of the pointed apex vertically above the point of the base; an arrangement which serves the purpose of bringing the centre of gravity nearer to the vertical, or straight, side of the monolith than would otherwise be the case were the apex placed centrally, or to the opposite side; in other words, the ultimate result of this idea of form is to bring the centre of gravity vertically above the fulcrum C sooner than would otherwise be the case were the stone of any other shape. Then again, the straight side is always the thicker, lending added assistance in raising the monolith by bringing the centre of gravity still nearer to the vertical, or straight, side. This distribution of weight also provides a better balance when the monolith is in position, bringing the greater mass upon the point of the base, and easing the weight upon the wedges. The widening and thickening towards the base helps to preserve a better balance by keeping the centre of gravity as low as possible. The east flanking stone at Old Keig may not entirely agree with the standard form in regard to the apex, but this may have been a natural fracture, and to have fashioned the stone correctly would have materially lessened its height, rendering it unsuitable for such a position of importance.

THE THEORY AS APPLIED TO STONEHENGE.

Perhaps no stone circle has received more attention than Stonehenge. Much has been written; and while there is slight variation of

opinion, most authors are unanimous in their belief that the trilithons at Stonehenge were erected from a horizontal position.¹ In the case of one trilithon that theory could be true enough; but some of the monoliths have provided an unsolved problem in the past.

William Gowland was the first to consider the problem seriously, and he it was who probably started the theory cited above; for he concluded positively that Stone No. 56 had been raised from the interior of the circle.²

To anyone acquainted with the monoliths of the Aberdeen stone

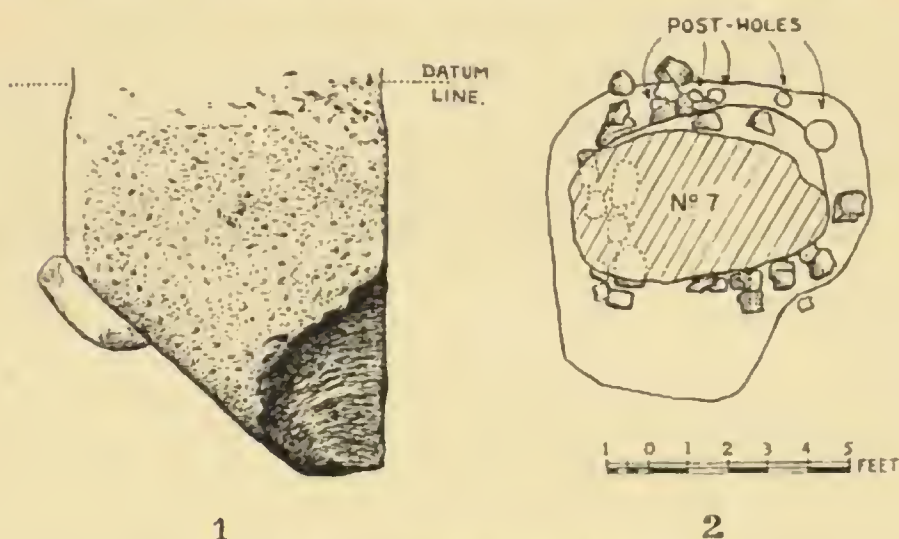


Fig. 6. Stonehenge: Stones Nos. 56 and 7.

(No. 1 after Gowland, *Archæologia*, vol. 58; No. 2 after Hawley, *Antiquaries Journal*, vol. 1.)

circles, Stone No. 56 is perhaps the best example that could have been chosen. Professor Gowland is careful to base his assumption on the absence of chalk rock on the N.-E. side, and on the inclined plane existing there. However, when we consider the shape of the base of this trilithon (fig. 6, 1), the solution becomes apparent at once, from our knowledge of the standardised form of the Scottish monoliths: for, not only does the base conform to the standard, but it rests against a wedge in the same manner as the east flanking Stone Pe

¹ The details of this popular theory are given in succinct form in Frank Stevens, *Stonehenge Today and Yesterday*. A more elaborate account is given in E. Herbert Stone, *The Stones of Stonehenge*, chap. vi. In regard to the latter, and probably both, the whole theory depends upon the monolith having a straight base, as witness Mr Stone's illustrations, yet most of the trilithons at Stonehenge possess pointed bases.

² William Gowland, "Recent Excavations at Stonehenge," *Archæologia*, vol. 58, p. 55.

at Old Keig. Undoubtedly, it was erected in the same manner. Professor Gowland is puzzled by the fact that the perpendicular face of the chalk had been cut away at the west corner (that next to the wedge).¹ This cutting probably was never intentional, but was caused either by the fulcrum slipping slightly as the stone was being raised or during the process of inserting the wedge.

Nothing could be more difficult than to raise the trilithon in the manner suggested by Professor Gowland. Had it been given a more or less regular, even base, upon which it could rest during the process of erection, there would be fewer objections to employing this crude and burdensome procedure: but, instead, with its present base, the stone would at once set up a rotary action, causing obvious difficulties and complications; and the energy required to prevent such an occurrence could be more profitably employed in erecting the trilithon. Once more the Bronze Age engineer is imputed to have possessed a complete lack of common sense.

In any case, Professor Gowland's theory is definitely disproved as a result of Lt.-Col. Hawley's excavations round Stone No. 1.² Col. Hawley is puzzled by the steepness of the crater, and is at a loss to know how the stone came to be erected. As he states, had the stone been tipped in according to Professor Gowland's assumption, the whole crater might have been ruined. On the other hand, had the stone been erected in the manner of the monoliths at Old Keig, the solution is not only obvious, but all danger of damaging the crater is avoided. In this case the stone tapers on both sides to a blunt point—a feature that was also noted in connection with Stones 29 and 30, and Stones 6 and 7.³ It is only by tapering both sides to a point that damage is averted. Had the base taken the form of that of Stone 56, the point of the base would have struck the edge of the crater as the stone was brought into position, unless, of course, the crater had been materially lengthened. This idea might be thought to imply a refinement upon the stones at Old Keig; but when the process of erection is again considered, it will be seen at once that a certain amount of efficiency has been sacrificed, and a greater thrust will be required to raise the monolith.

Apart from the stones themselves, Stonehenge adds to our knowledge in another direction. Allusion has already been made⁴ to a supposition concerning a wall, or buttress, of saplings, placed along one side to

¹ *Archæologia*, vol. 38, p. 82.

² "Second Report on the Excavations at Stonehenge," *Antiquaries Journal*, vol. II, p. 38.

³ Lieut.-Col. Hawley, "Stonehenge: Interim Report on the Exploration," *Antiquaries Journal*, vol. I., figs. 3 and 4.

⁴ See page 89.

restrain the monolith from toppling over in that particular direction. At Stonehenge a curious phenomenon was noted by Col. Hawley: in the cases of Stones 7, 1, and 30, post-holes were observed, cut in the solid chalk, and flush with the broad face of the monoliths. Let us consider in detail the case of stone No. 7 (see fig. 6, 2). Here, it will be observed, are four post-holes, ostensibly placed in line, with another, much larger than the others, situated a short distance in from the others. Into the first four post-holes were inserted four saplings of goodly height, and these would necessarily be supported from behind by means of struts, or their equivalents. These saplings would thus form a steady barrier sufficient to prevent the monolith from toppling over. The remaining post-hole must have taken the trunk of a small tree by its diameter, and seems to have served the purpose of a check.

A glance at fig. 6, 2 shows that all the packing blocks resting underneath the monolith are to be found on the north side, indicating that the stone was erected from that side. This agrees exactly with the position of the post-holes. After the stone had been raised in the manner of our theory, the restraining ropes would be placed around the apex just as the centre of gravity was approaching the vertical: thereafter, when the centre of gravity had passed the vertical, a restraining force would be applied to the ropes in a direction slightly towards the barrier of saplings, thus causing the stone to brush against them. If the restraining force was in line with the axis of the stone, there would be a tendency for the monolith to topple over in both directions, with obvious danger to human life. The buttress of saplings would be useful for adjusting the stone to the correct position: for, while the stone itself has support to keep it upright, it could without difficulty be moved either to the left or right until it was at the correct distance from its neighbour to receive the lintel: that position attained, chalk, rubble, and stones would be rammed into the interspaces to firmly anchor the trilithon for all time. When this last operation was complete, it would be necessary to cut the saplings off at ground level, in order not to disturb the newly-rammed rubble. This would explain the finding of decayed wood in the post-holes around Stones 1 and 30. The reason for firing the wood in the post-holes by Stone No. 7 is not obvious.

We thus observe that our theory, as upheld by the monoliths of the stone circles of the north-east of Scotland, when applied to the problem of Stonehenge, reveals much that is interesting. The builders seemed, however, somewhat unfamiliar with the new form, a condition that can be understood when it is remembered that Stonehenge antedates

the stone circles of the north-east of Scotland by several centuries,¹ during which period the new form had time to become standardised. An absence of standardisation is seen in the variety of bases. Stone No. 56 is, perhaps, the sole attempt at the ideal, the remainder appear to be experimental. Apart from mere form, however, it is interesting to observe the efforts of a people to attain an ideal; and it needs but an ideal to encourage invention.

In conclusion, the author desires to express his thanks to Professor V. Gordon Childe for permission to make use of the data concerning the measurements of the monoliths at Old Keig, and of the photographs, figs. 1, 2, and 3; and to the Society of Antiquaries of London for permission to reproduce the drawings of fig. 6.

THE THEORY EXPRESSED IN MATHEMATICAL TERMS.

By A. REGNAULD, B.Sc.(Eng., Lond.), A.R.C.Sc., M.I.E.E.²

The stone is assumed to be of even thickness, and to weigh 5 tons. Considering the ground to be horizontal, and CH to be vertical, it will be found that the point D is 2' 8" above the ground, i.e. DG = 2' 8". The

¹ Apart from entering into any controversy in regard to the dating of the recumbent stone type of stone circle, which has of late been regarded as belonging to Iron Age times (V. Gordon Childe, "Trial Excavations at the Old Keig Stone Circle," *Proc. Soc. Ant. Scot.*, vol. lxxvii, pp. 37-53), attention may be drawn to the fact that, at the period of the erection of the circles in the north-east of Scotland, cremation was the general practice, most yielding burnt bones, and many urns of the cinerary type. Of stone circles with a recumbent stone, the following have yielded fragments of urns: Seabinnay (F. R. Coles, "Report on Stone Circles in Kincardine and Part of Aberdeen," *Proc. Soc. Ant. Scot.*, vol. xxxiv, pp. 130-98, No. 18), Castle Fraser, Hutton of Ardyne (F. R. Coles, "Report on the Stone Circles of the North-East of Scotland, Inverurie District," *Proc. Soc. Ant. Scot.*, vol. xxxv, pp. 187-218, Nos. 4 and 21), and Candle Hill, Old Rayne (F. R. Coles, "Report on Stone Circles in Aberdeen, Inverurie, Eastern Parishes, and Inverurie Districts," *ibid.*, vol. xxxvi, pp. 448-581, No. 35). The circle at Burrellochs, Rappla Wood, yielded a cinerary urn, possibly cordoned (F. R. Coles, "Report on the Stone Circles of the North-East of Scotland, Chiefly in Aberdeenshire and Forgue," *Proc. Soc. Ant. Scot.*, vol. xxxvii, pp. 82-112). More definite evidence is forthcoming from the following circles: Tunck, Kintore, yielded three urns, one being of the overhanging rim type, and another cordoned (see Anderson, *Scotland in Pagan Times, the Bronze and Stone Ages*, p. 101); Crithie circle yielded two cinerary urns of late type (*ibid.*, p. 106). An encrusted urn was found within a circle at Glenballoch, near Blairgowrie (*Proc. Soc. Ant. Scot.*, vol. xiv, p. 60); while a circle at Tynrie, Ballinluig, yielded four large cinerary urns, "each of which was about 2 feet high" (Anderson, *loc. cit.*, p. 113). Fragments of cinerary urns were found in a circle at Kingmuir (*ibid.*, p. 113). A large urn full of burnt bones was found on the farm of Newton of Monthlary, during the process of demolishing a stone circle (*ibid.*, p. 115). Dr Cyril Fox believes this urn to be an intermediate form between the enlarged food-vessel and the encrusted urn (C. Fox, "An Encrusted Urn of the Bronze Age from Wales; with Notes on the Origin and Distribution of the Type," *Antiquaries Journal*, vol. vii, p. 115). Finally, an excavation at the stone circle at Balbirnie House, near Markinch, Fife, produced a number of broken urns of the cinerary type (Anderson, *loc. cit.*, p. 116). We thus see that the period to which the stone circles in the east of Scotland belong is the late Bronze Age. On the other hand, Stonehenge dates from the early Bronze Age (R. S. Newall, "Stonehenge," *Antiquity*, vol. iii, pp. 75-88).

² By courtesy of Alexander Russell, Esq., M.A., D.Sc., LL.D., F.R.S., M.I.E.E., Principal of Farnley House Electrical Engineering College, London.

magnitude of the thrust at D depends upon whether it is exerted in a direction perpendicular to CD, and it is questionable if human effort could be so exerted at a height of only 2' 8" from the ground.

Assuming, however, that the force P acts perpendicular to CD , taking moments about the point of contact with the ground, we get

$$P \times CD = W \times CF \quad \text{or} \quad P = \frac{W \times CF}{CD}$$

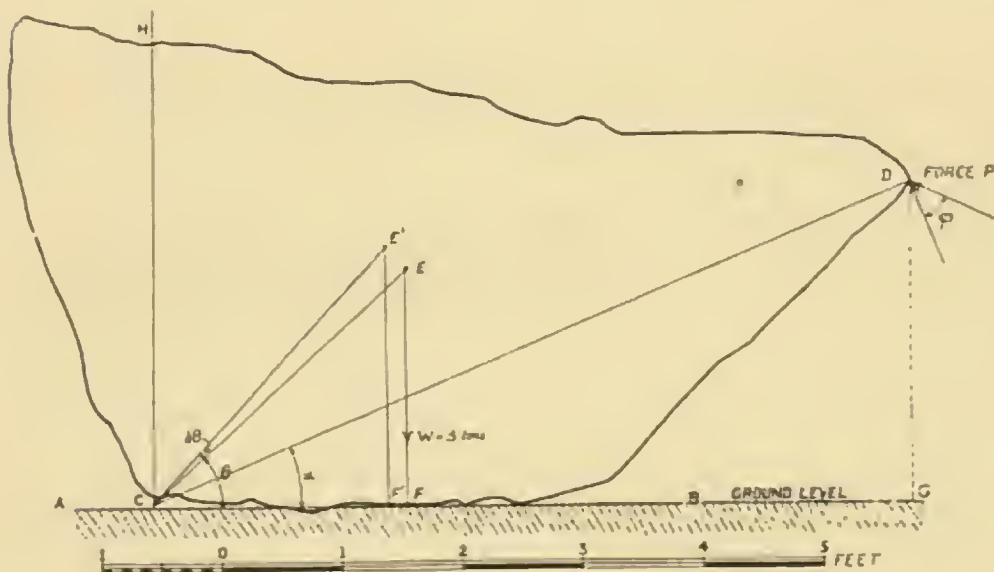


Fig. 7. Old Kelg Stone Circle: Stone Pm.

From the diagram (fig. 7) $CF = 2\frac{1}{2}$ ", and $CD = 6\frac{9}{16}$ ", so that putting $W = 5$ tons, we have

$$P = \frac{5 \times 2\frac{1}{2}}{6\frac{1}{2}} = 1.575 \text{ tons.}$$

Thus, the thrust required to raise the stone about the point C is 1.575 tons. (N.B.—If P is not perpendicular to CD but at an angle ϕ to the perpendicular, the thrust will be increased to $\frac{P}{\cos \phi}$.)

As the stone pivots about C the angle θ increases, as also does the angle α , but still assuming that the thrust is exerted in a direction perpendicular to CD we get

$$P \times CD = W \times CF' \quad \text{or} \quad P = \frac{W \times CF'}{CD},$$

and since W and CD are constant, we have $P \propto CF$.

But $\frac{CF'}{CE} = \cos(\theta + \delta\theta)$, so that $CF' \propto \cos(\theta + \delta\theta)$ or $P \propto \cos(\theta + \delta\theta)$, and when $(\theta + \delta\theta) = 90^\circ$, $P = 0$.

From the diagram

$$\theta = \cos^{-1} \frac{2' 1\frac{1}{2}''}{2' 10\frac{1}{2}''} = 74^\circ, \quad \text{or} \quad \theta = 42^\circ.$$

Thus, taking

$$P = \frac{W \times CE \cos(\theta + \delta\theta)}{CD} = \frac{5 \times 2' 10\frac{1}{2}''}{6' 9''} \cos(\theta + \delta\theta).$$

i.e. $P = 2.13 \cos(\theta + \delta\theta)$, we get the values given in the following table:—

when	$\theta = 42^\circ$, $P = 2.13 \cos 42^\circ = 2.13 \times .74 = 1.575$ tons.
	$\theta + \delta\theta = 50^\circ$, $P = 2.13 \cos 50^\circ = 2.13 \times .64 = 1.36$ tons.
	$\theta + \delta\theta = 60^\circ$, $P = 2.13 \cos 60^\circ = 2.13 \times .50 = 1.06$ tons.
	$\theta + \delta\theta = 70^\circ$, $P = 2.13 \cos 70^\circ = 2.13 \times .34 = 0.725$ ton.
	$\theta + \delta\theta = 80^\circ$, $P = 2.13 \cos 80^\circ = 2.13 \times .17 = 0.362$ ton.
	$\theta + \delta\theta = 90^\circ$, $P = 2.13 \cos 90^\circ = 2.13 \times 0 = 0$

It may also be noted that $\alpha = \sin^{-1} \frac{2' 7\frac{1}{2}''}{6' 9''} = 38^\circ$ or $\alpha = 23^\circ$, and when CE is vertical, *i.e.* $\theta + \delta\theta = 90^\circ$, $\delta\theta = 90^\circ - 42^\circ = 48^\circ$, so that $\alpha + \delta\alpha = 23^\circ + 48^\circ = 71^\circ$. The height of the point D above the ground will therefore be $6' 9'' \sin 71^\circ = 6.75 \times .945 = 6.375'$, or $6' 4\frac{1}{2}''$. Thus, the question again arises as to whether the thrust exerted by human effort would be applied in a direction perpendicular to CD at this height above the ground, or even whether it would be applied at D at all, rather than at some point lower down, in which case the value of P given in the above table will again have to be increased. The thrust in any case will, however, be zero when the centre of gravity of the stone reaches the vertical line CH.

MONDAY, 12th February 1934.

THE HON. LORD ST VIGEANS, Vice-President,
in the Chair.

A ballot having been taken, the following were elected Fellows:—

RAIMONDO N. DE PINTO, 4 Sloam Street, Leith.

SCOTT GUNN, Tynedale Hydropathic, Hexham, Northumberland.

IAIN ROBERTSON HILLIARY, The Lodge, Edinbane, Isle of Skye.

WILLIAM MACINTYRE, School House, Cronberry, Cumnock, Ayrshire.

DUGALD MACLEAN, M.A., LL.B., 10 York Place, Edinburgh, 1.

ALEXANDER GRANT M'LEOD, M.A., 10 Shankston Crescent, Cumnock, Ayrshire.

ROBERT SPOTTISWOODE MORPETH, Ph.C., M.P.S., 12 Darnhall Drive, Craigle,
Perth.

ROBERT G. TULLOCH, c/o Mrs Ross, 8 Darnell Road, Leith, Edinburgh, 5.

The following Donations to the Museum were intimated and thanks voted to the Donors:—

(1) By THE NICOLSON INSTITUTE, Stornoway.

Circular Belt Mount of Bronze, measuring $2\frac{1}{2}$ inches in diameter. In the centre is a projecting boss with a cavity $\frac{11}{16}$ inch in diameter, now empty, but originally containing a setting, possibly of amber; the sides of the boss are encircled by a herring-bone pattern, bordered on each edge by a plain narrow moulding. Surrounding this is a plaited pattern of three cords divided into two strands by an engraved line, with a beaded border outside. Round the outside is a raised border decorated with a beaded ring between two plain mouldings. The back is concave, and near the edge is a rivet in position, and a rivet-hole on the opposite side, for fixing the thin strap of bronze through which the belt would pass. This strap, $\frac{1}{4}$ inch in width at the centre, is broken across the middle and its recurved ends show two imperfect rivet-holes. Found near Valtos, Uig, Lewis, in 1915, along with Viking brooches and other objects. (See *Proceedings*, vol. I. p. 181.)

(2) By Rev. A. A. MILNE, F.S.A.Scot.

Communion Token of Free Church, Manning River, Australia, 1933.

(3) By ANGUS McLACHLAN, Loch Gorm House, Bruichladdich, Islay.
Relics from a Viking Grave at Ballinaby, Islay, Argyll, consisting of
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a Sword, an Axe, a Boss of Shield, remains of a Knife or Sickle, of Iron, and a Belt Buckle and a Free Ring-headed Pin, of Bronze. (See previous communication by A. J. H. Edwards, F.S.A.Scot.)

(4) By Miss CLEGHORN, Inveresk, North Berwick.

Clothes Beetle, measuring 15 inches in length, and Jam Ladle, measuring $13\frac{1}{2}$ inches in length, of Wood, from North Berwick.

(5) By H. COOKSON, Renton House, Grantshouse, Berwickshire.

Two polished, circular Discs of dark brown Stone, measuring $3\frac{1}{2}$ inches and $2\frac{1}{4}$ inches in diameter, and $\frac{1}{4}$ inch and $\frac{5}{16}$ inch in thickness; Whorl of red sandstone, imperfect, measuring $1\frac{1}{2}$ inch in diameter. Found near the quarry on Traprain Law.

(6) By DOUGLAS MCCALL, 68 Comely Bank Avenue, Edinburgh.

Six Stone Axes, measuring $2\frac{1}{2}$ inches, $2\frac{1}{2}$ inches, $2\frac{1}{2}$ inches, $2\frac{1}{8}$ inches, $2\frac{1}{2}$ inches, and $1\frac{1}{2}$ inch in length, and an Object of Stone, of octagonal section, imperfect, found on the surface after heavy rains in the neighbourhood of Bebiuniha, Gold Coast Colony, West Africa.

(7) By JOHN READMAN, Motor Agent, Earlston, Berwickshire.

Seven objects of flint, including a Scraper, measuring $1\frac{1}{2}$ inch by $1\frac{1}{8}$ inch, a Flake, one end trimmed obliquely, measuring $1\frac{1}{2}$ inch in length, four fine Flakes, of which two are notched, and a triangular Worked Flint, from Craigsfordmains, Earlston, Berwickshire.

(8) By F. RANKEN, 14 Douglas Crescent, Edinburgh.

Hinged Iron Collar, from Perthshire.

(9) By JAMES K. YORSTON, Jr., Hullion, Ronsay, Orkney.

Barbed Arrow-head of yellow Flint, measuring $\frac{1}{2}$ inch by $\frac{1}{4}$ inch; Scraper of brown Flint, measuring $1\frac{1}{2}$ inch by $1\frac{1}{4}$ inch, and Whorl of Shale or Jet, measuring 1 inch in diameter, found by the donor near the Knowe of Laird, Hullion, Rousay, Orkney.

(10) By H.M. OFFICE OF WORKS.

Plaster Cast of a Sculptured Panel of stone once in Kinkell Kirk, Aberdeenshire, showing the Crucifixion, the Virgin Mary to the right of the shaft of the Cross, and an angel kneeling before a chalice from which issues the Divine Spirit to the left. On the cross arms are the initials I.N.R.I. In front of the base of the Cross, which is stepped, is an altar, on which is placed a chalice, with a book on a lectern to its

left. On the right side of the altar is the officiating priest, seated, and, to the left, four human heads representing people in stalls. On the altar frontal are the initials A.G., for Alexander Galloway, who was Rector of Kinkell, in Lombardic letters. These initials are repeated at the top of the panel.

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By H.M. GOVERNMENT.

Calendar of the Close Rolls. Henry VI. Vol. ii., A.D. 1420-1435. London, 1933.

(2) ANONYMOUS.

The Letters of Sir Walter Scott, 1817-1819. London, 1933.

(3) By Sir GEORGE MACDONALD, K.C.B., LL.D., D.Litt., F.B.A.,
President.

Materialien zur Römisch-Germanischen Keramik herausgegeben von der Römisch-Germanischen Kommission des Deutschen Archäologischen Instituts, Frankfurt A.M. Heft 6. August Oxé. Frühgallische Reliefgefäße vom Rhein. Frankfurt A.M., 1934.

(4) By THE CURATOR, Russell-Cotes Art Gallery and Museum,
Bournemouth.

Bulletin. Vol. xii., No. 4, December 1933.

(5) By the Marquis MORITATSU HOSOKAWA, President of the Far
Eastern Archaeological Society.

Nan-Shan-Li. Brick-Tombs of the Han Dynasty at the foot of Mt. Lao-tieh, near Port Arthur, South Manchuria. *Archæologia Orientalis*. Vol. iii. Tokyo and Kyoto, 1933.

(6) By MAURICE P. DUNLAP, F.S.A.Scot.

The Leonardo Map of the World, 1452 or 1453. In the Collections of the American Geographical Society. By John Kirkland Wright, Ph.D. New York, 1928.

(7) By Dr SOPHUS MÜLLER, Honorary Fellow, the Author.

Jernalderens Kunst i Danmark. Copenhagen, 1933.

(8) By J. GRAHAM CALLANDER, LL.D., Director of the National Museum.

Los Celtas y el pais Vasco. By Pedro Bosch Gimpera. San Sebastian, 1933.

Los Celtas en Portugal y sus Caminos. Dr Pedro Bosch Gimpera. Portugal, 1933.

(9) By THE DIRECTOR.

Bulletin of the Museum, Valletta, Malta. Vol. i., No. 4. Valletta, 1933.

The following Communications were read:—

I.

LOCH LOMONDSIDE FONTS AND EFFIGY.

By A. D. LACAILLE, F.S.A.Scot.

Two examples of mediæval sculpture are described in the first section of these notes which relate to Luss parish, Dumbartonshire. They are a baptismal font and an effigial monument in remarkably good condition considering their history. Both were accidentally brought to light at the same time during the latter half of the eighteenth century when road improvements were being effected near Bauldry, about a mile and a half south of Luss village. The operations, necessitating the partial or total demolition of a large cairn, long known in the region as *Carn mo-Cheasog*,¹ or *St Mackessog's Cairn*, showed that whatever other purpose the tumulus might have served, it had at least been the hiding-place of two relics belonging to a mediæval church. Deduction makes it seem probable that these antiquities, so fortuitously exposed and fortunately preserved, came from the pre-Reformation kirk of Luss.

We learn from the *New Statistical Account*, vol. viii., footnote, p. 161, that the effigy, referred to in the parish report as "a statue of St Mackessog," must have long been exposed after discovery, for it is stated that it formerly stood at Bauldry. If one may be permitted to

¹ Kessog, *Cessie* or *Cessing* (W. F. Watson, *Celtic Place names*, pp. 277-8), was one of the early Scottish saints who had earned the endearing prefix *ma* or *mo* before his name. Thus has been derived the appellation *St Mackessog* by which he is perpetuated in many parts of Scotland.

judge from the more weathered appearance of the font, the report that it was allowed to lie in the bed of a stream must be credited. Howbeit, eventually effigy and font were removed to the ruined chapel and mausoleum of the Colquhoun family at Rossdhu, where for many years they remained together in the roofless structure. In their situation at the east end of the building they were drawn for Wm. Fraser's work *The Chiefs of Colquhoun*, but the plate facing p. 56, vol. ii., shows the not unusual artist's licence in the rendering. Later the effigy came to be housed inside Rossdhu, where I first saw it, and the font served as an accessory in the rose-garden. Two years ago the proprietor, Sir Iain Colquhoun, Bart., transferred the effigy to the parish church, where it now reposes on a well-constructed base of solid masonry. It is hoped that the font will soon be placed under the same roof which now protects its partner in vicissitude. Thus both font and effigy will have returned to the site whence, it is believed, they were removed centuries ago.

Since the late Mr Wm. Russell Walker, F.S.A.Scot., published his careful compilation and descriptions of ancient Scottish fonts and stone basins supposed to have been used as fonts¹ (but which cannot all be considered as baptismal vessels), little has appeared in our *Proceedings* on the subject of such ecclesiastical appurtenances to supplement the list made by this observant antiquary. The Luss example, therefore, is an addition to the record prepared for the important communication made so far back as 1887.

Closely examined in the autumn of 1932 and the summer of 1933, the font preserved at Rossdhu proves to have been hewn from a quadrate block of hard grey sandstone (fig. 1). It is 1 foot 8 inches in height, and at the top it measures 2 feet 1 inch by 2 feet 1 inch. Narrowing very gradually and evenly downward it retains its square section, and at the base its dimensions are 2 feet by 2 feet. For 3 inches on all the vertical edges a sort of ogee moulding relieves what otherwise would be a squat and plain appearance. Each face, 19 inches wide at its upper part, has been ornamented with narrow and fairly deep grooves cut parallel to the horizontal and vertical edges, but weathering and injury have been responsible for the ablation of much of these sculpturings. Portions of grooves running parallel to the edges of the horizontal surface show that the top has been treated ornamentally in the same simple manner as the four faces.

Measuring 19 inches in diameter the receptacle for the baptismal water is practically cylindrical for the whole depth of 12½ inches. The font is provided with a drain-hole 1½ inch in diameter at the

¹ *Proc. Soc. Ant. Scot.*, vol. xxi. pp. 346-449.



bottom of the basin, but widening like a funnel through the thickness of the stone to a width of 5 inches at the orifice.

When the font was cleared of all adhering plant growth it was found that pieces of the iron fastenings for holding down the lid and padlocking the vessel according to rule remained firmly fixed in no

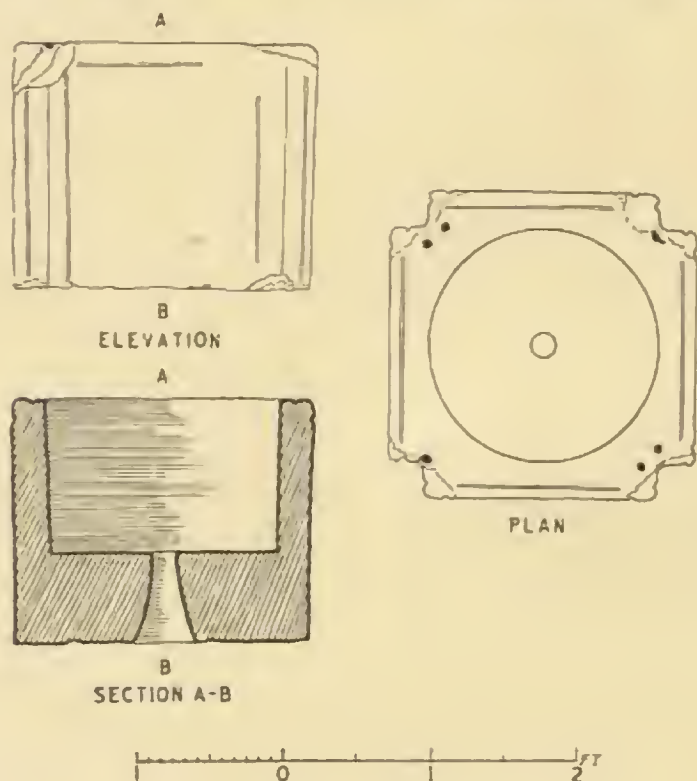


Fig. 1. Font at Rosdhu.

less than five of the six holes bored for their reception.¹ These metal fittings were disposed so that each alternate corner held either a pair of studs set 1 inch apart or but one single and larger piece of iron. What now appear to be fragments of a pair of studs may be

¹ The rule decreed that the font should be protected by some form of cover. Should the font be placed either in a baptistery, whose gates were kept unlocked, or in a church without a separate and proper baptistery, then the lid must be secured by means of a lock. —Abbé Paul Bayart in *Liturgia*, pp. 254-5.

The prevention of unauthorised access to the baptismal water kept in the font, either for fifty days or ten months according to whether it was consecrated on Holy Saturday or on the Eve of Pentecost, has its origin in the fact that frequently the liquid was stolen for those magical properties it was supposed to possess. —Vide Francis Houd's *Fonts and Font Covers*, p. 281.

remains of staples which passed through a wooden lid, and the single stud one of two pins, bolts or eyes, holding a bar across the covering.

Nothing exists upon the nether surface which might afford a clue to the type of base upon which the font was set.

All the corners of the font have been injured, but more particularly the upper ones. The regularity of the breaks would point, I think, not to any wilful damage, but to the manner in which the vessel was moved when it was conveyed to its place of concealment, or on its journey later to Rossdlm. This opinion is supported by the state of preservation of the effigy, which seems to have suffered by accident only. That the font and effigy should have been taken so far to hiding and safety would argue that they were deposited complete in the cairn where they were recovered ages later. It would appear that the great weight of the font was such that the easiest way to move it was by pushing it over on its corners as do porters and carmen with bulky cases.

One cannot determine with assurance to what period this font belongs as its characteristics are conflicting. The weathered appearance gives it a suggestion of archaism, and to a certain extent the simplicity of ornamentation would point to antiquity. On the other hand, the shallow mouldings indicate late rather than early mediæval sculpture. Several Scottish tetragonal ecclesiastical stone vessels, including baptismal fonts, have been illustrated and described by Mr Russell Walker, who is inclined to regard them as early.¹

Unfortunately when the effigy was removed to the parish church no photograph was taken, and its present situation between the last row of pews and the eastern wall under the memorial window, together with inadequate lighting, made it a most difficult task to obtain full-length views of the monument from above. Mr James Devine, Glasgow, was able, by placing a pair of steps on the narrow window-sill behind the effigy to take two photographs from which one composite view in plan was made. This and the side view show the principal features of sculpture and the details of the prelatie vestments in which the human figure is imaged (figs. 2 and 3).

The effigy of grey sandstone, representing a bishop, mitred, vested, and shod for the celebration of pontifical high mass, is a full-length figure. The monument measures 6 feet 10½ inches from the slightly damaged tip of the mitre to the base of the footrest. Save for the missing extremity of the mitre and the mutilated fingers of each hand the monument is practically in the same condition as when it was finished by the sculptor. Whatever cleansing it underwent when taken from

¹ *Proc. Soc. Ant. Scot.*, vol. xxi. p. 346 ff.

the precincts of the ruined chapel at Rossdhu to the shelter of the house, or when the statue was presented to Luss Kirk, has effected such a restoration that the stone figure almost appears to be freshly hewn.

The body of the effigy lies on a slab $3\frac{1}{2}$ inches thick, bevelled for $1\frac{1}{2}$ inch along its full length on both sides, and the head reposes on a plain rectangular pillow $18\frac{1}{2}$ inches by $12\frac{3}{4}$ inches by $3\frac{1}{2}$ inches, also chamfered. The feet rest upon a block $18\frac{1}{2}$ inches wide and $10\frac{1}{2}$ inches high, the corners neatly angled off for 5 inches. These parts, apparently additional to the sculpturing of the prelate, are, nevertheless, integral with the whole monument which is carved out of a single block of stone. The plain finish of the pillow and footrest is not a common feature of episcopal effigies; it seems to be more usual to find the

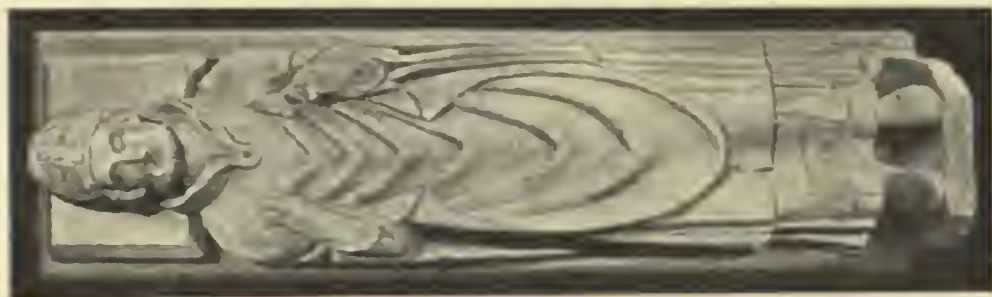


Fig. 2. Effigy in Luss Kirk.

pillow elaborated or provided with tassels at the corners, while the footrest frequently takes the form of one or more animals symbolic of some virtue. Such particularities, nevertheless, are not sure guides to period, as examples of simplicity or elaboration of sculpture occur irrespectively.¹ Mr Fred. H. Crossley, F.S.A., suggests that quality of stone influenced sculptors,² and, no doubt, locally obtaining ideas or the memorialist's own were expressed in these modifications.

The head, like the rest, is extremely well executed, and the ascetic face wears an austere expression. This effect is enhanced by the conventionalised manner in which the mouth is represented by a mere slit, but with slightly protruding although narrow lower lip. The thin and straight nose is delicately chiselled and seems to be an added feature, having been cemented in place at the bridge, but in appearance

¹ Cf. English examples, Fred. H. Crossley, F.S.A., *English Church Monuments* (New Issue), Section III., p. 177 ff.

A freestone effigy of a mitred abbot at Dorchester, Oxon, circa 1300-30, very closely resembles the Luss monuments as regards these plain features.—*Ibid.*, fig., p. 189.

² *Ibid.*, pp. 17-9.

it does not differ from the surrounding stone. A moustache is represented by two loops carved in relief, each loop coming far down upon the cheek from the nostril. The swelling extending from below each well-carved ear and round the chin may be regarded as a rendering of whiskers and beard, although they want the waviness expressed in the cut-out sculpturings representing thick locks of hair protruding under the mitre and behind each ear. Our Fellow, Mr F. C. Eccles, considers that the manner in which are shown the beard, moustache, and hair, points to work not long posterior to the thirteenth century.¹

The mitre is an example of the bishop's distinctive headgear at what is probably the most pleasing stage in its development, namely, about the beginning of the fourteenth century, or about a hundred years before the vertical sides of the cap had given place generally to



Fig. 3. Effigy in Luss Kirk.

the diagonal shape and gradual increase in height. Very evidently it was intended to portray the *precious* rather than the simpler *embroidered* or *golden* mitre.² In this case the ornament consists of the usual circular band or *circulus*, comprising a raised strip round the rim. The mitre is further ornamented with the central vertical strip, or *titulus*, together with braiding along the sides of the cap and horns; thus, slightly sunken compartments are left on either side of the upright strip. The decorative braiding bears what is intended to be a series of plain but large gems or metal plaques of lozenge or oblong shape. In each of these lateral depressions is a large boss representing a stone *en cabochon*. The mitre is devoid of the two lappets which are customary appendages of a prelate's head-dress. This instance of absence of lappets is by no means unique, although the deficiency is not common. Recently,

¹ Letter to the author, dated Minehead, 23rd November 1923.

² One may reasonably discount the alternative that an abbot is portrayed here, as only by special indult could this dignitary be permitted to wear the *precious* as well as the *simple* and *golden* mitres. — *Codex*, c. 319-27. Apparently such concession would be granted only to principal abbots of a monastic order.

however, my attention has been drawn to a few English and Continental mediæval and even later examples.

The greater vestments represented are the amice, alb, dalmatic, and chasuble, but the short tunic or tunicle, visible sometimes on effigial monuments of bishops and abbots, does not show here. Over the dalmatic is worn a long, graceful chasuble whose general character and fulness point to fourteenth century style. It will be noticed that the amice as sculptured does not differ from habitual mediæval usage in that it is worn loosely round the neck.¹ While ecclesiastical vestments have not materially changed through the ages, it may yet be observed that the loose piece of amice hanging in front is one more indication of the same period. The alb, partly covered by the chasuble and dalmatic, falls down to the ankles. It is ornamented with a raised rectangular patch near the foot, the whole thus representing the long appparelled ecclesiastical robe worn over the cassock, and it is very distinctly of the type universally worn in the British Isles before the Reformation by clerics vested for the more solemn offices. Although a recumbent monument is concerned, in accordance with mediæval practice the vestments are represented in folds such as would occur were the ecclesiastic standing. This characteristic is most apparent in the case of the chasuble which falls in seven folds on the body.

By the arrangement of its ends, the mass stole shows how it is worn by mitred dignitaries, namely, not crossed over the body as in the case of simple priests when the splays would hang more to the sides. Its ends widen slightly from below the hem of the dalmatic towards their extremity near the feet and well beyond the middle of the apparel ornamenting the alb. The manipule over the left wrist is narrower and much longer than the modern one.

The fingers of the ungloved hands have been broken, but the injuries they have sustained are not so extensive as to make their pose indeterminate. No ring appears on any of the fingers of the right hand, either on those clenched or on those raised in the characteristic attitude of giving the episcopal blessing. One can see that the clasping fingers

¹ In his *The Church of Our Fathers* (New Edition, London, 1905), vol. I. p. 383, Dr Daniel Rock, referring at length to the amice of the Middle Ages, states that, as a result of his examination of mediæval monuments imaging ecclesiastics in their sacred vestments, he has always found the amice to be shown as worn very loosely round the throat.

He knew a few exceptions, but these were Italian and only one English, and this of the Marian period, strongly influenced no doubt by Rome.—*Ibid.*, pp. 381-2.

The amice represented in the Luss monument, although wider and looser, is of the type still worn by the secular clergy of the Roman Church. In the case of the religious orders the amice forms part of the alb, and at certain times during the office it is drawn over the head. Formerly it was quite usual for the secular clergy also to wear the combined alb and amice. A present-day survival of this is recognisable in the fact that the officiating priest, when vesting, first puts the amice on his head while repeating the appropriate prayer.

of the left hand were meant to hold a crozier; but this staff, an adjunct of metal or wood and detachable from the effigy, has disappeared. What elaborations of form were taken by the long handle cannot now be conjectured, but there may have existed some emblem in addition to the crozier, because from the maniple downward to beyond the knee the stone has been worked to a perfectly straight and smooth surface, cutting away the folds of the vestments on the left side. Such preparation would scarcely seem necessary for the accommodation of a simple shaft.¹

The prelitic shoes are perfectly plain and take the typical form of slippers decreed for dignitaries of the Church having the right to wear pontifical vestments.

In a former paper to this Society I referred to the associations of St Kessog with Luss,² and this early missionary has been mentioned in a number of works. It will not be necessary, therefore, to make more than a short recapitulation of Kessog's connection with the district to establish a basis for the hypothesis that the effigy of the bishop is a conventionalised representation of the local saint, whose *cultus*, although centred at Luss, was widespread in Scotland until the Reformation.

In the cult of martyrs, ever an outstanding feature in Christendom, the British Isles were not behind the Continental countries in the veneration paid to the memory and relics of those who had laid down their lives for the Faith. To cite a single example in point, one has but to consider the numerous dedications in honour of St Thomas of Canterbury, to whose shrine thousands of pilgrims flocked from all parts of the Christian world. It is not difficult then to understand how honoured must have been the remains believed to be those of St Kessog, possibly the first in Scotland to be held worthy of the martyr's palm.

Kessog, tradition says, was martyred at Bandry and buried in Luss church, and the place near the saint's retreats became an important resort of pilgrims in pre-Reformation times.³ Luss parish abounds in place-names suggesting a connection with St Kessog, and in the neighbourhood are several ancient church sites. The outline map, prepared

¹ Assuming that the monument is a conventionalised representation of St Kessog, the patron of the parish, who was long venerated in Scotland not only as a martyr but as a warrior saint, either the broad palm of martyrdom or perhaps even a sword may have been placed against the left side. The peculiar suggestion of associating a weapon with an ecclesiastic is put forward in view of my having lately noticed in the Highland effigies of medieval bishops against whose sides rest a sword. The arm, however, is symbolic of the temporal power wielded in life by the deceased.

² *Proc. Soc. Ant. Scot.*, vol. lxii. p. 85 ff.

³ *Old Statistical Account*, vol. xvii. pp. 264-5.

for this communication, shows the distribution of places related to the ecclesiology of the Loch Lomondside parishes (fig. 4). Doubtless many of the names go back to remote antiquity, but in the fourteenth century, or nearly 800 years after Kessog's death, we find positive reference to him by name. We learn that "when Malcolm, fifth Earl of Lennox, granted a charter to John of Luss (1292-1333) of various rights and exemptions, he did this 'for reverence and honour of our patron, the most holy man, the blessed Kessog.'"¹ This charter was confirmed by Robert I. in 1308,² and seven years later the same king went so far as to grant sanctuary within a circle, three miles in radius, round Luss church,³ St Kessog in all cases being specifically named in the documents. Probably it was because of the importance it enjoyed as a devotional and ecclesiastical centre that in 1429 Bishop John Cameron raised Luss church to rank as one of the six prebendaries of the diocese of Glasgow.

According to legend the cairn at Baudry was set up by pilgrims to mark the spot where St Kessog was martyred opposite Inchtavannach, his island retreat. It was then a singularly happy thought, and practical too, which prompted the choice of such a place wherein to conceal the precious effigy of the tutelary of the parish and also the font.

Esteem and the general regard in Scotland for St Kessog, the martyr, called for a monument worthy of him. With this in view the statue was carved for the tomb and shrine containing his reputed remains, but no sculptor could truly portray him as none had ever seen him. Recourse to conventionalisation was therefore necessary, for so in each age of mediæval art have been treated representations of celestial beings, the prophets and personages of the Old Testament as well as the early martyrs and saints, of none of whom could anyone know the appearance. From this fact too, and the history of their lives and deaths, are derived the conventional attributes of these different persons, the majority of whom were figured in stone and picture as belonging to the period in which was living the executing artist. It follows then that the patron of Luss parish, commemorated in the ancient Scottish calendar, 10th March, as a bishop, would be represented conventionally according to this prelate dignity, and to honour him most he was imaged as vested for mass. Other considera-

¹ *The Chiefs of Colquhoun*, vol. II, p. 275.

² John of Luss is referred to as "... dilecto et fidei Bachulario ..." a title indicating that he was a court official or possibly the keeper of some relic. The full text relating to Luss is quoted in *Old Statistical Account*, vol. xvii, p. 265, from a charter dated 28th September 1308.

³ "Sciatis nos confirmasse Deo et Beato Kessogo in perpetuum illam libertatem quæ dicitur *gyrth*, videlicet, circa ecclesiam de Lusse per speculum trium milliarum ex omni parte, tam per terram quam per aquam. ..." Original grant, dated 18th March 1315, preserved at Buchanan Castle.



1919-1933
SURVEYED BY A. D. LACAILLÉ

Fig. 1. Ecclesiastical Map of Loch Lomond and District.

tions apart, the dating of the monument, it seems, must be deduced as much from the habiliments as from the style and rendering of the stone effigy.

Had the effigy been found near or in the cathedral church of the diocese—Glasgow—it might have been postulated that a bishop of the see had been figured in stone with the intention of placing an effigial monument on his tomb in his own cathedral, where he would be buried according to usage and his right. But it is advanced that the Luss monument can be none other than a representation, albeit conventionalised, of the parish patron imaged in the same manner as the tutelars of so many other churches, except that in this instance, where his tomb existed, there was occasion to portray him in recumbent attitude. Rare indeed were the churches which contained the tomb and shrine of the saint in whose honour they were dedicated. Few, therefore, could have other than a statue representing their patron, either in a niche or standing upon a pedestal.

According to canon law and the *Rituale* it is to be understood that effigial monuments in honour of deceased persons might only be erected in a church when these persons had the right of sepulture within the building, and were actually entombed there. The decrees, although perhaps not so rigorously applied in the past, aimed to reserve church entombment for those who had been the spiritual and temporal leaders of the people.¹

An engraving by Sandby allows one to visualise the pre-Reformation church of Luss as it was in 1751, or twenty years before it made room for a successor, in turn replaced in 1875 by the present building. While the background of mountains is fanciful, the style of the church is more definite. The print, for the sight of which I am indebted to the Rev. Alex. Slater Dunlop, B.D., formerly incumbent at Luss, figures the old kirk as a simple Gothic structure, possibly of the latter half of the thirteenth century.² This church enshrined the supposed remains of its tuteilar, over whose tomb lay the effigy discussed in these notes. Considering the period to which the pre-Reformation church of Luss apparently belonged, the great disparity in point of date between its erection and the remote time, to which the death of Kessog is assigned, makes it reasonable to conclude that earlier ecclesiastical buildings stood on the site.

¹ *Liturgia*, p. 257.

² The earliest allusion to the church of Luss is in a charter of confirmation by Maldoven, third Earl of Lennox, granted about the middle of the thirteenth century (between 1225 and 1270), confirming its patronage to Maldoven, Dean of Lennox, and to his son Gulemore.—*Chiefs of Colquhoun*, vol. II. p. 46. Wm. Fraser believes the church to be of greater antiquity.—*Ibid.* (Probably this author had in mind an earlier building which stood on the site.)

It may be that certain architectural and artistic details reached Scotland later than when they were in vogue farther south, but as a whole style made simultaneous advance. Thus, from the general character of the effigy and details of the vestments (and particularly the mitre, amice, and chasuble), the monument would be of early fourteenth century execution. Such date not only agrees with the evidence of documents attesting the veneration and esteem for the patron of Lass, but also with what was probably the time when pilgrimages were at the height of their popularity; the historical, political, and religious reasons for which are not within the scope of this communication.

In a paper to this Society the late Mr F. W. Brydall, commented upon the circumstance that all Scottish pre-Reformation effigies and statues representing ecclesiastics were mutilated.¹ In the present instance, however, the monument has suffered so little that without exception all its details are discernible. Whatever damage it received does not appear to have been other than that occasioned by careless handling in transport, and possibly by the manner of its concealment under a heap of rough stones. From the fact that a number of years after the official change in the religious system in the sixteenth century the Laird of Lass saw fit to apply for a papal dispensation to contract a second marriage, it may be inferred that the Reformation did not immediately affect the Loch Lomondside parish.² Consequently danger to the effigy at the hands of iconoclasts was not regarded as imminent. Even when at last peril did seem to threaten the statue, there was yet time to remove it and the font to a place of security. With surviving sentiments of respect for the traditional site of the martyrdom of St Kessog, marked by a heap of stones, this was chosen as the most fitting place in which to conceal two objects so intimately associated with the religious life of the inhabitants of Lass parish.

To Sir Iain Colquhoun, Bart., D.S.O., of Lass, and the Rev. Alastair Campbell, M.A., I am indebted for facilities of access to the monuments in their care. Grateful acknowledgment is due to Mr F. C. Eeles, F.S.A.Scot., for having discussed the details of these antiquities and for his valued suggestions. The comments of the Rev. Dom Cuthbert Wilson, O.S.B., Messrs F. C. Clapham, F.S.A., Jas. S. Richardson, F.S.A.Scot., and Fred. H. Crossley, F.S.A., are appreciated. My thanks are given to the Right Rev. Dom Fernand Cabrol, O.S.B., O.B.E., the Rev. Dom Louis Gougand, O.S.B., and the members of the Benedictine

¹ *Proc. Soc. Ant. Scot.*, vol. XLX, p. 333.

² *The Cartulary of Colquhoun*, p. 401.

community of Farnborough Abbey for so generously placing their liturgical learning at my disposal.

FONT AT BUCHANAN, STIRLINGSHIRE.

Many years spent in research and recording the antiquities of the Loch Lomond district have established the fact that only a few stone basins can be traced. Some well-executed specimens of the not distant time, when large utensils of stone were used for domestic purposes and accessories to agriculture, can be placed in this category. What may be mortars, and at least two knocking-stones of exceptional external finish, have been noticed. Only two examples can be treated definitely as ecclesiastical vessels, and one other may also have served in a church. The Luss font described is not the only baptismal vessel left on Loch Lomondside, for a particularly good mediæval example is preserved in the parish church of Buchanan (fig. 5).

The basin, mounted on a modern column and base, is a fine octagonal font, which, upon close inspection, reveals details worthy of comment despite the weathering long suffered by the soft light brownish-grey sandstone whereof the vessel is hewn.

Each side of the octagon measures 12 inches, the diameter of the basin 1 foot 10 inches and its depth 8 inches. The bottom of the cavity is flat over a distance of 16 inches, thus the walls curve but gradually inward. In the centre of the bottom of the basin is a square drain-hole $1\frac{1}{4}$ inch wide, countersunk for $\frac{3}{4}$ inch. From $\frac{1}{4}$ inch downward below the inner rim the stone differs slightly in shade from above and from the rest. The dissimilarity is distinct although the friable stone has peeled somewhat and its weathered surface was smoothed down before the font was re-erected. The regularity of the line demarking the change of coloration inside the basin, and the very small difference of plane in the surface



Fig. 5. Font in Buchanan Kirk.

above it, point to the basin having been lined (doubtless with lead), as would be necessary with material whose porous nature was proved in the course of my inspection.

As the lining supposed to have existed once has disappeared, there are no marks to show whether the font was divided. No holes or metal in the surface of stone between the basin proper and the outside edge indicate that the font had a lid similar to the one originally covering the Luss example. One may infer, therefore, that this font possessed a simple lid of the tightly fitting plug type or a more or less ornate and heavy movable cover.

The exterior bears plain carving, the zone below the rim is 5 inches high and finished off by a pair of mouldings. Below these, but retaining the octagonal form, the font tapers downwards to its irregularly fractured base above which are remains of similar mouldings now partly obliterated by cement binding the vessel on to its modern substructure, 1 foot 9 $\frac{1}{2}$ inches in height, conforming in respect to shape with the ancient stonework.

Between the rim and the upper pair of mouldings are vestiges of two rows of inscription similar to mediæval so-called "black-letter" which fill seven of the eight vertical faces. The eighth face is occupied by traces of two equal-armed cruciform figures described by what still appear to be lobes of a leaf, and between the crosses remains of a floral ornament are visible. All these sculpturings are incised, but efforts to determine their nature have so far been vain; only what looks like the Latin word "pace" being if anything less indistinct.

Mr Russell Walker figured no less than sixteen Scottish fonts of octagonal shape which have come down to our day.¹ All but three of the examples illustrated by him are ornate, and, to judge from their different decorative treatment, they would range over a long period, possibly from as far back as the thirteenth century until the Reformation.

It has been suggested that this font may have been brought to the mainland from the now completely ruined parish church on Inchcailench² (from which island the former parochial name was derived), but this supposed provenance cannot be proved. Be this as it may, by 1621 access to the island was found to be so difficult, and the church there so ruinous, that the small chapel of St Mary-Kilmichael, situated on the newly acquired territorial addition to the parish consisting of the forty-pound land of Buchanan, came to be used by the people. Among the mounds denoting the site of St Mary's the font lay until 1898,

¹ *Proc. Soc. Ant. Scot.*, vol. xxi. p. 316 ff.

² *Trans. Glas. Arch. Soc.* (New Series), vol. iv., part i., p. 81.

when it was set upon a new base in the present parish church built after little more than a century's use of the chapel, which stood about a mile and a half to the south-east of the later structure now housing the relic.

Under this heading it was mentioned earlier that one more stone vessel preserved in the Loch Lomond district might have served in a church. The example in question was identified about thirty-five years ago in Drymen village by the Rev. Wm. H. Macleod, B.A., B.D., who, ascertaining that it had come from the ruins of St Mary's, Buchanan,¹ removed it for safe keeping to the parish church, where it stands within the porch.

Never described nor figured, it is now opportune to place this antiquity upon permanent record, as Mr Macleod's surmise that it is a holy-water stoup seems to be well founded, for the shallow basin and the carefully hewn octagonal block are of such a nature that it is most unlikely the object could have been employed elsewhere than in a church. This opinion is supported by the close comparison it provides with a number of mediæval stoups still serving which the writer has noted abroad. The basin, $7\frac{1}{2}$ inches in diameter, $2\frac{1}{2}$ inches deep, is cut out of the uppermost surface of an octagonal shaft of grey sandstone whose dressed vertical faces have peeled badly. Each side is 5 inches long, giving a full width across of 12 inches, while in height the simple vessel measures 14 inches (fig. 6). One side appears to have been fastened to a wall and the base to have been bracketed.



Fig. 6. Font from St Mary's, Buchanan.

¹ *Trans. Glas. Arch. Soc.* (New Series), vol. lv., part I., p. 81.

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² *Trans. Glas. Arch. Soc.* (New Series), vol. iv., part i., p. 81.

ERRATUM.

“Font” in fig. 6 *should be* “Holy-Water Stoup.”

[To face p. 112.]

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Fig. 6. Font from St Mary's, Buchanan.

¹ *Trans. Glas. Arch. Soc.* (New Series), vol. lv., part I., p. 81.

ECCLESIASTICAL SITES ON MAP OF LOCH LOMOND AREA.

KILLIS PARISH, Perthshire, that portion lying in Glenfalloch.
Patron—*St Fillan*.

Eas Eòdhnain (*Adamnan's Waterfall*) and Croit Eòdhnain (*Adamnan's Croft*): name of natural feature and site associated with St Adamnan. (W. J. Watson, *Celtic Place-names*, p. 270.)
Stùc n' Chabeil (*The Rock, or Pinnacle of the Chapel*): round cairn; remains of chapel; ancient cemetery. (*Proc. Soc. Ant. Scot.*, vol. lxiii. pp. 343-4.)
Meall an-t-Sagairt (*The Priest's Hill*).

BUCHANAN PARISH (formerly INCHCAILLEACH), Stirlingshire.
Patron—*St Kentigerna*.

Mulan an-t-Sagairt (*The Priest's Slack*)—hill-top: in proximity to reputed ecclesiastical site.
Rowardennan (probably from *Ros-ard-Eòdhnain, The Point of Adamnan's Cape*). (*Celtic Place-names*, p. 270.)
Lenc n' Mhinisteir: *desertum*.
Balmaha: place-name associated with St Tua or Thatha.
St Maha's (Tua or Thatha) Well: remains of round cairn. (*Celtic Place-names*, p. 238.)
Ballinjour Wood (*Baile an droir, The Wood of the Sleuding of the Keeper* (of some relic)): within its confines is supposed earthwork. (Cf. "Ballindewar," "Ballindeoir" in *Celtic Place-names*, pp. 265-6.)
Church Burn (Burn of Achlais).
St Mary's and St Michael's (Kilmichael): site of chapel; ancient cemetery; font and stoup found. (*Trans. Aberdeen Eccles. Soc.*, vol. iii. pp. 352-3.)
Inchcailleach (*Innis nan Cailleach, The Island of the Nuns*): *desertum* of St Kentigerna; site of nunnery; ruins of church; ancient cemetery; remains of supposed cell; sculptured stones. (*Trans. Glas. Arch. Soc. (N.S.)*, vol. iv. pt. i. pp. 75-82; *ibid.*, 26-7.)

DRYMEN PARISH, Stirlingshire.
Patron—*St Columba*.

Drymen: ancient cemetery.
Drumakill (*Draim na cille, The Ridge of the Cell or Graveyard*): ecclesiastical site; sculptured stone.
St Valdrin's Well, now covered. (The saint's name is obscure.) (*P.S.A. Scot.*, vol. xvii. pp. 201-2.)
Ibert (*Iobairt*): land gift to Church. (*Celtic Place-names*, p. 245; *R.M.S.* 1591.)

KILMARONOCK PARISH, Dumbartonshire.
Patron—*St Ronan*.

Ibert (*Iobairt*): land offering to Church. (*Celtic Place-names*, p. 254; *R.M.S.* 1900.)
Kilmaronock: site of St Ronan's Church; ancient cemetery; sculptured stone. (*P.S.A. Scot.*, vol. lxi. pp. 137-8.)
St Ronan's Well.
Aber: site of St Kessog's Church. (*Trans. Glas. Arch. Soc. (N.S.)*, vol. iii. p. 355.)
Shanneles (*sean eaglais, old church*): site of church.

Old Kirk: place-name associated with *Shanacles*; site of ancient cemetery. (J. Guthrie Smith, *Strathendrick and its Inhabitants*, pp. 126-7.)
 Inchmurrin (*St Mirren's Island*): site of chapel and cemetery.

ARROCHAR PARISH.
 Dumbartonshire.
 Formed in 1648 from northern part of Luss parish.

Clach nan Tairbh (*The Rock of the Bulls, or The Pulpit Rock*): meeting-place for religious services. (*P.S.A. Scot.*, vol. lxiii. pp. 333-6, and *Trans. Folk-Lore Soc.*, vol. lxi. pp. 233-5.)

LUSS PARISH. Dumbar-
 tonshire.
 Patron—*St Kessog*.

Luss: remains of church; ancient cemetery; sculptured stones; resort of pilgrims to shrine of *St Kessog*; legend of herbs associated with the translation of *St Kessog's* relics. (*P.S.A. Scot.*, vol. xix. pp. 418-9; *Trans. Glas. Arch. Soc. (N.S.)*, vol. v. pt. i. pp. 23-6; *P.S.A. Scot.*, vol. lix. pp. 114-6; *ibid.*, vol. lxii. pp. 88-90, and *ibid.*, vol. lxviii. (present volume) pp. 107-11.)

Tom na Paidir (*The Hill of the Lord's Prayer*): probably a pilgrim's station. (Cf. *Celtic Place-names*, p. 260.)

"Tombstone House": dwelling-house so called locally because stones from Luss old kirk and kirkyard are incorporated in its walls. The facts, mentioned in footnote to p. 89 of *P.S.A. Scot.*, vol. lxii., have been verified.

Bauldry and Carn na-Ceasoig (*St Mackessog's Cairn*): traditional site of the martyrdom of *St Kessog*; site of cairn in which were found effigy and font. (*Old Statistical Account*, vol. xvii. p. 264; *New Statistical Account*, vol. viii. p. 161 and footnote; *Trans. Glas. Arch. Soc. (N.S.)*, vol. v. pt. i. pp. 23-4.)

Rosdhu: ruins of *St Mary's Chapel*. (*Chiefs of Colquhoun*, vol. ii. pp. 59-60.)

Inchtavannach (*Innis Igh a' Mhannich, The Island of the Monk's House*): *Tom a' Chluig (The Hill of the Bell)*; *Clach n' Mhinisteir, desertum* of *St Kessog*; site of *St Kessog's Cave, desertum*; site of monastery and cemetery; sculptured stone. (*P.S.A. Scot.*, vol. lxii. pp. 85-8.)

St Michael's Chapel: ruins of chapel and built platform above it; diversion of small stream to north of site. (*Chiefs of Colquhoun*, vol. ii. pp. 60-1; *P.S.A. Scot.*, vol. lxii. pp. 96-8.)

Glenuallochan: sculptured stones from *St Michael's Chapel* built into farmhouse. (*Chiefs of Colquhoun*, vol. ii. pp. 60-1; *P.S.A. Scot.*, vol. lxii. pp. 97-8.)

Edentaggart (*The Priest's Hillside*): residence of priest serving *St Michael's Chapel*. (*Chiefs of Colquhoun*, vol. ii. p. 61.)

Beinn a' Mhanach (*The Monk's Mountain*).

Luss Sanctuary, enclosed by circle three miles (Scots)

in radins. Granted by Robert I., 18th March 1315.
(*Chiefs of Colquhoun*, vol. ii. pp. 60-1.)

BONHILL PARISH, Dumbartonshire.
Patronage cannot be traced.

Anchenheglish (*Ach(adh) an-h-eaglais*, *The Field of the Church*): site of church and cemetery. (*New Statistical Account*, vol. viii. p. 222.)

Cross Stone Well.

Ladyton: land grant made in 1442 by Isabella, Duchess of Albany and Countess of Lennox, to St Mary's Chapel (afterwards Collegiate Church) Dumbarton.

RHU PARISH, Dumbartonshire.
Formed in 1648 from parts of Rosneath and Cardross parishes.

Ballevoulin: Chapel Dermid; round cairn; sculptured stone. (*New Statistical Account*, vol. viii. p. 75; *P.S.A. Scot.*, vol. lviii. pp. 128-30.)

St Bride's Well.

Kilbride: site of round cairn, chapel and cemetery; sculptured stone. (*P.S.A. Scot.*, vol. lviii. pp. 128-30.)

Kirkmichael: place-name associated with nearby site of St Michael's Chapel and cemetery.

Fuslane: ruins of St Michael's Chapel; ancient cemetery. (*New Statistical Account*, vol. viii. p. 75; MacGibbon and Ross, *The Ecclesiastical Architecture of Scotland*, vol. ii. pp. 557-9.)

Priest's Well (St Michael's).

Nemet (*Nemthor*, *Neret*): supposed area of extension of sanctuary whose name is enshrined in the place-name "Rosneath" on the west side of the Gareloch, *q.v.* (*Celtic Place-names*, pp. 246-7.)

ROSNEATH PARISH, Dumbartonshire.
Patron—*St Modan*.
(*Modan* = *M'Aedán* or *M'Aodhán*, vide *Celtic Place-names*, p. 289.)

Rosneath (*Ros-neimhidh*, *The Promontory of the Nemet or Sanctuary*). This sanctuary extended to the east side of the Gareloch, now in the parish of Rhu, *q.v.* (*Celtic Place-names*, pp. 246-7); ruins of church; ancient cemetery; sculptured stones. (*Early Christian Monuments of Scotland*, pp. 453-4; *P.S.A. Scot.*, vol. lix. pp. 146-7.)

St Modan's Well.

Site of monastery: foundation of the Canons Regular. (Michael Barrett, O.S.B., *A Calendar of Scottish Saints*, p. 21.)

Portkil: remains of burial mound. (*New Statistical Account*, vol. viii. p. 117.)

Kilereggan: ecclesiastical site.

II.

CLAY CASTLE-BUILDING IN SCOTLAND. BY W. MACKAY
MACKENZIE, M.A., D.LITT., F.S.A.Scot.

In the year 1230 King Hacon of Norway sent a fleet of twenty ships to the "Southern Isles," that is the Hebrides, for the purpose of restoring order there and re-establishing his personal authority. Alan, Earl of Galloway, whom the saga calls "the greatest warrior in that time," was harrying round these islands, Ireland, and Man, and the Hebridean "Kings . . . were very unfaithful to King Hacon." By recruitment among the isles the fleet came to include eighty vessels, the crews of which would possibly number in all about 2000 to 2500 men. The story is told in Hakon Hakonsson's saga, which was written in 1264-5 but survives only in imperfect copies or abbreviated versions.¹ I take the text compiled by Vigfusson for the Rolls Series with a translation by Sir George Dasent, where the narrative is as follows: The ships "sailed afterwards south off the Mull of Cantire and so in to Bute. And there sat the Scots in Castles, and there was a steward at their head, one of the Scots. The Northmen ran in to the Burg and made a hard assault on it. But the Scots defended themselves well, and poured down on them boiling pitch and lead. Then fell many of the Northmen and many were wounded. They bound over them 'flakes' of wood" (obviously as a protection against the burning liquids), "and after that they hewed at the wall, for the stone was soft; and the wall crumbled before them. They hewed at it on the ground. . . . Three days they fought with the Burg-men ere they got the burg won."² The version in the Flatey Book expands one passage to the effect that "the Norwegians hewed the wall with axes, because it was soft."³

The castle in question has been identified, perhaps correctly, with that of Rothelay, and it has been debated whether the existing outer wall, in its original state over 20 feet high and 8 to 10 feet thick, is that which was hewed into by the Norse besiegers. In 1872 Mr William Burges, a London architect, was commissioned to make a report upon the castle for the Marquis of Bute.⁴ He describes the wall as "constructed of a hearting of rough rubble, enclosed by outer and inner faces of cut sandstone." The upper 10 feet or so of the wall is

¹ See preface to edition in Rolls Series, pp. x, xvii-xix; *Early Sources of Scottish History*, A. O. Anderson, vol. II, p. 473.

² Chap. 167.

³ Anderson, as cited.

⁴ *Bute in the Olden Time*, Rev. J. King Hewison, vol. II, pp. 107-32. On the castle, see also my *The Medieval Castle in Scotland*, pp. 40-1.

obviously a later addition. Then came the question whether the lower and older part was that which had been breached by the Norsemen. Mr Burges accordingly asked Mr Thomson of Rothesay to make a careful examination, and Mr Thomson wrote as follows: "At several places, both inside and out, where the square facings have been removed and exposed the interior of the wall—I mean the curtain-wall—between the towers and the lower part thereof, the hearting appears to be the same as I described in my last letter. It certainly is not sandstone throughout, but a mixture of a variety of stones, such as could be gathered off the beach. Many of them are round and water-worn, and the mortar does not adhere to these so well as to rough sandstone or squared rough blocks, and it would not surprise me to read that the Norwegians in their attack upon the castle found it to be of *soft stone*. What sandstone there is in the wall is certainly very soft. Their first impression in the attack upon the walls would be that it consisted of soft stones, and I do not think they would have much difficulty with heavy tools, however rude they may have been, in getting through the wall; the smoothness of many of the stones would render the task less difficult."¹ Evidently Mr Thomson wrote without consideration of the wording in the saga. It was not a matter of "heavy tools, however rude," but of hewing with what were normally weapons of war: while stone which had become "soft" by the nineteenth century need not—indeed cannot—have been so decadent seven hundred years before. Mr Burges's own comment was: "From this examination it would appear to be a doubtful point whether the present walls are those besieged by the Norwegians"; adding the further remark: "It is also by no means certain that the castle in question was the one at Rothesay."

The latter plea is, of course, quite relevant, as the place is not named or otherwise specified in the saga. Dr Joseph Anderson, indeed, was inclined to look for it elsewhere. Discussing brochs in general he wrote: "It very often happened that where we should most naturally look for a reference to this class of structure in the sagas, we find that the word is not 'borg' but 'kastala,' a castle. But in the narrative of the invasion of Bute by King Olave the Swarthy² the words are used interchangeably, although the description of the mode in which the 'borg' was assailed, and the reference to the 'soft stone-work' coming tumbling down, might lead to the supposition that it was an uncemented structure."³ He then goes on to say that it is probable

¹ *Bute in the Olden Time*, Rev. J. King Hewison, vol. II, pp. 123-4.

² King of Man, who was one of the leaders of the expedition.

³ *Archæologia Scotica*, vol. v., part i., p. 100.

there were brochs in Bute, implying that the Norse attack was upon a structure of that class.

Now, optimistic as architects may have been as to the possibility of "hewing" into a wall of stone and lime 8 feet thick and making it "crumble," it is even more startling to face the possibility of performing the same operation on a broch wall or any "uncemented structure" and causing it to "tumble down," a result which was likely to be more disconcerting to those engaged in the work than to those within.

On the whole the implication of the narrative is that we have to do with a castle proper. There was a garrison commanded by "a steward" and including knights—one of whom was captured and ransomed—and to get possession of the place cost the besiegers 300 men. The steward was shot dead "as he sprang on the burg-wall," an expression scarcely compatible with the idea of a broch. Further, if melted lead was poured over on the attackers, a very rare use of so valuable a metal—in one of the accounts only pitch is mentioned—this would imply a building within having lead on its roof, and a broch could have no accommodation for such a structure. If, then, we really have to do with a castle, Rothesay has the best claim to identification. The latest writer on the subject, Mr J. Storer Clouston, in his *History of Orkney* (1932), p. 218, dealing with this campaign, refers to "the storming of Rothesay Castle as its most dramatic episode." The Norsemen, he says, "hurled themselves against the castle walls with a reckless valour that cost them 300 slain outright ere they forced their way in by the desperate expedient of hewing at the soft stone till they had made a breach." But this vigorous and picturesque rendering of the matter-of-fact language of the saga account must not be allowed to obscure the crucial point that effecting an entrance by "hewing" at stone, however "soft," presents us with a technical problem that calls for explanation. The Norsemen were a practical and adaptable people, and the idea that they would set themselves to breach a heavy stone wall, either cemented or uncemented, with sharp-edged tools, is quite out of character; almost the most stupid of men would have thought of some more suitable expedient. We are reduced to the alternatives that either the saga writer is perpetrating a grotesque blunder, or that the wall in question, despite its description as of "stone" (*steinn*), was of something different from our strict understanding of that term.

The only comparable action which I have found is that of the treatment by an English force in 1518 of a "strong pele" belonging to William Armstrong of Kinnmont. a structure, it is explained, "buylded

aftour sick maner that it coult not be brynt ne distroyed unto it was cut downe with axes."¹ Now such a procedure as that of the Scots at "Downam" tower, when they "hewed up the gates of the barmkyn with axes,"² is quite ordinary. A peel was in origin, and still in many cases, a palisade—never a tower—and therefore open to the same treatment, varied only by setting it on fire, as when English raiders in 1544 burned "all the peels in Myddleby and Middleby Woods."³ But in the Armstrong case neither method was adequate; the destruction and the burning were only achieved *after* it had been cut down. The special and particular wording of the passage must be explained on the understanding that this peel was a composite erection of timber and clay, of which the wood could be burnt only after it had been disengaged from the mass, which for its part had to be disintegrated by axes. Probably, too, not timber of any size, but such as would be used in the construction of what was known as "wattle and daub"—a framework of split logs and brushwood loaded and compacted with clay. And in this usage we probably have an explanation of the repeated charge against the Scottish borderers in the sixteenth century of stealing "allers [alders] and other rammell wood [*i.e.* brushwood or underwood]" on the English East March, "whiche ys to them a greatt proffyte for the mayntenuce of their houses and buyldinge."⁴ The Scots would cross the border to hunt, and "when they were a hunting, their servants would come with cartes, and cutt downe as much wood, as every one thought would serve his turne, and carry it away to their houses in Scotland."⁵ But timber of this slight portable kind could be useful structurally only as a framework or reinforcement for clay.

I conclude, therefore, that the castle wall in Bute hewed at by the Norsemen was of this kind, though not necessarily of this particular composition; as will be shown presently, there was another variety. In any form, however, the essential material was clay, a compacted substance still soft enough to yield to a cutting edge, and do so in a way which could be described as "crumbling." If, then, Rothesay Castle be the *locus* of the exploit, the wall in question is not that still existing but a predecessor. Certainly the word used is *steinu*, but it is clear that the term once had a significance rather wider than our settled usage of "stone." In German "brick" is *backstein* and in Dutch *gebakkenstein*, in both cases just "baked-stone." A parallel term in

¹ *Letters and Papers, Henry VIII.*, vol. iv., part II., p. 1828.

² *Calendar of Border Papers*, vol. II. No. 431.

³ *Letters and Papers, Henry VIII.*, vol. xix., part II., p. 373.

⁴ Sir Robert Bowes, *Book of the State of the Frontiers and Marches, etc.* (1542), in Hodgson's *History of Northumberland*, vol. II., part III., pp. 201-5.

⁵ Sir Robert Cary's *Memoirs* (ed. 1759), p. 165.

English is "stoneware" for a coarse pottery. But a clay wall was virtually air-dried brick, and there is nothing odd, therefore, in finding it described as of *steinn* or "stone."

This conclusion can now be illustrated from the oldest description we possess of a Scottish castle, which, further, is of a date probably not more than twenty years before the siege under consideration. It occurs in the Old French romance of *Fergus*, the only portion of the Arthurian cycle of which Scotland is the stage. The writer was a Frenchman of Picardy, but he clearly had a good direct knowledge of Scotland. The name Fergus is taken from the historical Galloway personage of that name, who flourished in the middle of the twelfth century. The poet tells how the father of the hero lived in a castle overlooking a valley near to the "Irish Sea."¹ This residence was on a great grey rock and was surrounded by an enclosure of "hurdles,"² or something of the nature of what used to be called "stake and ryce" or "stob and ryce": that is, posts interwoven with brushwood. "On the summit of the rock," says our author, "was a tower, which was not made of stone and lime; its high walls were of clay and had crenelated battlements."

Here, then, we have an unmistakable case of a tower of clay, and if a tower of this material was possible, so much the more easily a wall. The word used for clay is "*terre*," as it is in the combination *terre-cuite* or the Italian *terra-cotta*, or the German *gebrannte Erde*, all signifying pottery, but literally "burnt" or "baked earth." *Terraglia* is also the Italian word for crockery: Roman red or "Samian" ware is more specifically called *terra sigillata*. "Earth" in this connection, then, is "clay," and in that sense survives in the descriptive term "earthenware." In the accounts for the reconstruction of Edinburgh Castle by

¹ En un castiel desus un val
Manoit uns villains de Pelande
Ases pres de la mer d'Irlande.
Desus une grante roche bise
Ot sa maison molt bien asise
Faitte de clines tote entor,
En son le pui ot une tor.
Q'n'ert de plere ne de caus.
De terre estoit li murs fais haus
Et creneles et batilles.

Fergus, Roman von Guillaume le Clerc (ed. Halle, 1872), lines 304-13.

"Pelande" is for "Peigðhtland." The sounds represented by *ch*, *gh*, being foreign to French would disappear, and the *t* be assimilated to *l*, giving "Pe(l)lande."

² This word, now *clais*, was adopted into Latin and appears in the accounts for the reconstruction of Stirling Castle 1300-7: *et in xl clays de virgis factis, necnon et ccc "knyches" virgarum pro hujusmodi clays inde faciendis et cubandis tam super astra camerarum quam super cumulos domorum predictarum subitus cooperturam* ("and in forty hurdles made of rods, also three hundred faggots of rods for making hurdles of this kind and laying them over both the roofs of the chambers and the topmost parts of the aforesaid houses under the thatch"). Baln's *Calendar of Documents relating to Scotland*, vol. III, p. 305.

the English in 1335-6 we have an entry relating to *terram et turbas pro daubatura et pro coopertura diversarum domorum*; that is, the houses were thatched with turf (*turbas*) and the walls "daubed" with *terra* or clay, which was regularly used for this purpose.¹ In the same century we get the lines from the English translation of *Le Roman de la Rose* attributed to Chaucer:

"But and he couthe through his sleight
Do maken up a tour of heicht,
Nought rought I whethir of stone, or tre,
Or erthe or turves though it be."

(*The Rommant of the Rose*, lines 7059-62.)

Here we have note of towers of stone, timber, turf, and earth, that is clay.²

This usage, then, gives us the key to the passage in Bishop Leslie's history, published in the late sixteenth century, in which, speaking of the Borderers, he says: *Potentiores sibi pyramidales turres, quas piles vocant, ex sola terra, quæ nec incendi, nec nisi magna militum vi, ac sudore deiçei possunt, sibi construant.*³ ["The more important men build for themselves square towers, which they call piles, from clay alone, which cannot be burned, nor, except by a great number of soldiers and much labour, be cast down."] Observe the precision and the implications of Leslie's words. These were the towers of *potentiores*, or "head-men" as they would be called, not of any humble class. They were constructed of clay only, a fact thus stressed in order to make it clear that no stone was included, that it was not a matter of using clay as a mortar, just as we find the writer of *Fergus* also at pains to exclude any misunderstanding. Leslie does not specify even what ingredient was used to toughen the clay, though such, as will be seen presently, may be assumed. One great advantage of these structures was that they could not be burned, and

¹ *Calendar of Documents relating to Scotland*, vol. iii, p. 318.

² The passage in the original is:

Mais ele se tant d'engin avoit
Qu'une grant tor faire savoit,
Ne li chausist ja de quel pierre
Fust sans compas ou sans esquierre,
Neis de motes ou de fust
Ou d'autres riens queques ce fust.

(Lines 12609-701.)

Here specific mention is made only of stone (*pierre*), turves (*motes*), timber (*fust*).

³ *De Origine, etc., Scotorum*, Rome, 1578, p. 61.

⁴ Dalrymple in 1786 translates *pyramidales* as "four nulked" or four cornered. The word is also used by an early eighteenth-century writer to describe the brochs, which, he says, are "of a Pyramidal Form, or like a round Dovecote, broad below and drawing narrower to the top" (*Description of the Isles of Shetland*, Sir Robert Sibbald (1711), ed. 1815, pp. 20, 42). The Border piles of clay may thus have had a slight inward inclination.

burning was the usual resource of Border raiders, who had no time for a prolonged siege of strong places. They could, of course, be demolished, but to accomplish this within a reasonable time called for the hard work of many men, another handicap in the case of a mere raiding party, to whom rapid action was essential. We see, too, that edifices in this material were still being built on the Borders in the sixteenth century. Many at least of the buildings then called "piles" must have been of this character. In the list of places destroyed by the army commanded by the Earl of Hertford, which desolated south-eastern Scotland in 1544, we have categories not only of "burghs, castles, and towers," but also of "villages, piles, and stands." One case is instructive. On the night of 17th May "the army encamped at a pile called Ranton, eight miles from our borders: which pile was a very ill neighbour to the garrison of Berwick. The same we razed and threw down to the ground."¹ As the army marched to Berwick next day, and the "razing" must thus have been accomplished sometime between night and morning, it cannot have been an operation of exacting difficulty. The "pile" can scarcely have been a tower of solid stone and lime; it was "razed," not blown up, and most probably was just the sort of erection in clay which Bishop Leslie describes and specifically calls a "paile," the occasion too being one in which the requisite "great number of soldiers" was available.

On this line we can account also for the frequent discrimination between "piles" and "stone houses";² they were erections of different constituents. Certain Border operations too become more intelligible. In three days of the last week of September 1545 Hertford took a force "endlong" the Merse, burning and wasting "thorough out," yet found time to capture and leave "clerely overthrowen to the ground . . . sondre piles and strong towers, as the Red Brayes, Polworths, Westurbeth, Duns, Wetherburne, Blacketer, Mongus Walles, Mothers Malyson, and others."³ This was a heavy programme if we assume that all these places were buildings of stone and lime. In that case 'overthrowing them to the ground' would in itself be no light task, apart from their capture and the other operations in wasting and burning over many miles of country.

Suggestive, too, is a private enterprise of forty men, mostly "thieves" of Redesdale and Tynedale, who came to the house of Cunzierton, about six miles south-east of Jedburgh, "with lodderis, spadis, schobs, gavelokis (=crowbars), and axis, cruellie assegit, brak, and undirmyndit the said

¹ *The Late Expedition in Scotland, 1544*, Reprint 1880, p. 16.

² *State Papers, Henry VIII.*, vol. v. pp. 521, 523-4, etc.

³ *Ibid.*, p. 527.

place, to have wynyn the samyn."¹ This assemblage of tools for a small company in a hurried undertaking certainly points to something less formidable than a stone tower, but spades, crowbars, and axes would serve to make a way into a structure of the type described by Bishop Leslie.

Another term for clay was "mud" with its Latin equivalent *lutus*. Pliny supplies the name of the inventor of the clay or mud house (*lutei edificii inventor*), who took the idea, he says, from the nests of swallows.² It was a prescript of St Francis that the houses of his friars should be constructed of clay and timber (*ex luto et lignis*),³ and at Assisi they had originally only a little building of clay and twigs (*parvam cellam . . . cuius parietes erant ex viminibus et luto*) which was thatched with straw. The English accounts for the rebuilding of Stirling Castle in 1336-7 record payments for "digging mud for daubing the said peel" (*fodiendum lutum pro dicta pela daubanda*).⁴ Elsewhere the "daubing" material is "clay" (*fodiendum argillum [sic] . . . ac daubancium tam parietes, etc.*).⁵

We now see the nature of the walls drawn round Perth by Edward Balliol's English army after their success at Dupplin Moor in 1332, when, Wyntoun says,

"The towne syne thai closyd all
And envyrownd wyth a mude wall."⁶

Then, on the recovery of the town by the Nationalist party in 1339,

"The mude wall dykis thai kest down,"⁷

the "mud wall" being further described as a "dike" in the modern Scottish sense. Such a wall, as will be seen presently, could be quickly raised and at no great expense. Again, at Edinburgh in 1339-40 the English were "making 'modewalles' around the castle."⁸ In *The Wallace* we have a description of Rannoch Hall, where there was "Bot mudwall werk withoutyn lym or stayn."⁹ In none of these places is it a question of an earthen rampart, which of itself would at that time be of little service as a defence except as a basis for a palisade, in which case it is the palisade, as the effective obstacle, that would be mentioned. The largest towns in Scotland in 1333, we are informed by the Flemish chronicler Jean le Bel, were "enclosed with

¹ From unprinted MS. in British Museum cited in Armstrong's *History of Liddesdale, Eskdale, etc.*, Appendix xxxiv. p. II. "Schols" is not to be found in any dictionary; possibly related to German *schieben*, to shove, push, etc.

² *Nat. Hist.*, lib. vii. cap. 50.

³ *Speculum Perfectionis*, II. 7, 10, 11.

⁴ *Babu's Cal. of Docts.*, III. p. 367. The reading *littum* given in the print is obviously in error for *lutum*.

⁵ *Ibid.*, p. 365.

⁶ Bk. viii. lines 3625-6.

⁷ Bk. viii. line 5558.

⁸ *Cal. of Docts.*, III. No. 1323.

⁹ Bk. xi. line 680.

good ditches and good palisades" (*palis*).¹ Had such erections been intended, neither clerk nor chronicler would have thought it necessary to distinguish them as "walls," or further define them as not constructed of stone and lime. What we have to envisage are actual walls of solid clay. And we see that walls of this kind were being drawn round Perth and Edinburgh Castle more than a hundred years after the Norse had cut their way through one at the castle in Bute.

We can get more light on the material by coming down to late historic times. The schoolmaster of the poet Robert Burns, in his account of his one-time pupil, describes how Robert's father, William Burness, erected a dwelling which, "with the exception of a little straw," was "literally a tabernacle of clay," and he varies his subsequent references, in dominie fashion, by styling the house an "argillaceous fabric" and a "mud edifice." This is the "clay biggin" still preserved at Ayr. A detailed description of the practice in such constructions may be taken from the *Statistical Account of Scotland*² under the parish of Dornock, Dumfriesshire, with the heading *Mun-Houses*: "The farm-houses in general, and all the cottages are built of mud or clay. . . . The manner of erecting them is singular. In the first place, they dig out the foundation of the house, and lay a row or two of stones, then they procure, from a pit contiguous, as much clay or brick-earth as is sufficient to form the walls: and having provided a quantity of straw, or other litter to mix with the clay, upon a day appointed, the whole neighbourhood, male and female, to the number of 20 or 30, assemble, each with a dung-fork, a spade, or some such instrument. Some fall to the working the clay or mud, by mixing it with straw: others carry the materials; and 4 or 6 of the most experienced hands build and take care of the walls. In this manner, the walls of the house are finished in a few hours. . . . This is called a daubing." Pennant in his *Tour in Scotland, etc.* (1772), p. 76, writes in briefer terms of the parish of Canonbie, Dumfriesshire: "Most part of the houses are built with clay: the person who has building in view, prepares the materials, then summons his neighbours on a fixed day, who come furnished with victuals at their own expence, set cheerfully to work, and complete the edifice before night." The whole process reminds us how in these latter times, under the stimulus to cheap, rapid building, we have reverted to the ancient practice, substituting the stouter cement for clay.

These details have been preserved only for the humbler constructions of Scottish villages and hamlets. Necessarily, however, they would apply to the more pretentious erections of this character with which

¹ *Chronique*, chap. xxii.

² Vol. ii, p. 22.

we are here concerned. Building of this kind was, of course, not confined to Scotland. A "mud house" which existed till recent times at Great Hatfield, Yorkshire, had "walls built of layers of mud and straw which vary from five to seven inches in thickness. . . . The way in which mud walls were built is remembered in the neighbourhood. A quantity of mud was mixed with straw, and the foundation laid with this mixture. Straw was then laid across the top, whilst the mud was wet, and the whole left to dry and harden in the sun. As soon as the first layer was dry another layer was put on, so that the process was rather a slow one. . . . Such mud walls are very hard and durable, and their composition resembles that of sun-burnt bricks."¹ Mr Leeds suggests as "more than probable" that this was the method of constructing the walls of late fifth-century Saxon houses which he excavated at Sutton Courtenay, Berkshire.²

More imposing structures of this composition are referred to by Du Cange (*Art. Lutani*), who cites certain twelfth-century Spanish inscriptions; one regarding a "hall of St John the Baptist, which formerly was of clay (*olim fuit luteam*), but which the late King Ferdinand and his Queen built in stone (*edificarunt lapideam*)."³ The epitaph of the same Ferdinand in 1103 records: "He constructed this church of stone, which formerly had been of clay." (*Et fecit ecclesiam hanc lapideam, quæ olim fuerat lutea.*) In this connection it should be noted that Fearn Abbey in Ross-shire "is said to have first been made up of mud."⁴

For our special purpose, however, the most illuminating passage is in an account of Ireland written by Richard Stanyhurst. Stanyhurst was born in Dublin in 1547, but was a graduate of Oxford. He supplied Holinshed with material for the Irish history in that writer's *Chronicles*. In 1579 he removed to Antwerp, where he remained till his death, and where in 1584 he published his treatise *De Rebus in Hibernia Gestis*, from which I take the following passage: "These chieftains, therefore, possess castles strongly built as a fortified mass of stonework, with which are closely connected halls of considerable length and breadth fashioned of clay or mud. These are not wholly roofed either with stone slabs from a quarry or with unhewn blocks or with tiles, but for the most part are covered with straw from the fields. In these halls it is their custom to take their meals but rarely to sleep, which

¹ *The Evolution of the English House*, by Sidney Oldall Addy, revised and enlarged edition, 1903, p. 63. Cf. a similar description for Cumberland in *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society*, vol. ix. (1909), p. 121, where it is offered for a farmer's house in the reign of Elizabeth.

² *Archæologia*, vol. lxxiii. (1922-3), p. 183.

³ *Statistical Account*, vol. iv. p. 296.

they do in their castles, for enemies can easily apply burning torches fanned by the wind to the roofs of the halls, since that material very quickly catches fire."¹

This, then, is evidence from Ireland contemporary with that already cited from Bishop Leslie for Border "piles" in Scotland. Generally it seems to have been the case that for simple defence, where a regular siege or the use of war-engines was not to be contemplated but only a sudden raid and the possibility of fire, such clay structures, cheaply and quickly erected, could be regarded as adequate. Their existence too may clear up some other puzzling facts besides the Norse attack on the castle in Bute. We may thus account for the very late character of most of the existing Border towers in stone and lime, and for the readiness with which English raiding columns could destroy many of their predecessors. Earlier ones must often have been of the class described by Bishop Leslie. Further, there can have been few, if any, towers throughout the country without their adjoining small buildings—stables, byre, barn, and such like—which we find referred to as "necessar houses." In few cases, however, do we find traces of these, and the explanation here too is probably the clay material of which they would be composed.

With towers and walls or palisades of timber we are familiar enough, but clay defences of this character have escaped observation; they were so easy to remove without leaving a trace. Yet of their former existence there can be no doubt, and they supply a hitherto unregarded stage of transition towards the much more costly but more defensible tower of stone and lime.

¹ Richard Stanyhurst, *De Rebus in Hibernia Gestis*, Antwerp, 1584, p. 32. *Hi igitur principes . . . castella possident, munitione ac mole lapidum fortiter instructa, cum quibus oculis suis magnæ et amplæ, ex argilla et luto fictæ factæque, vicinæ adhesionem copulantur. Non sunt sarte tectorum aut anserum laminis et lapidibus erutis, aut cumentis, aut tegulis, sed agrariis culmis ut plurimum conteguntur. In istis oculis epulari solent: raro tamen somnium, nisi in castellis capiunt: quoniam oculorum integumentis hostes possunt urdentes facies, aeris flabello ventilatas, facillime admoveere, quandoquidem ista materies ignem perceleriter concipit.* The phrase *ex argilla et luto* simply repeats the one idea in synonymous terms for the sake of emphasis.

III.

A SHORT CIST CONTAINING A BEAKER AT KIRKHIIL, KILTARLITY,
INVERNESS-SHIRE. BY PROFESSOR ALEX. LOW, M.A., M.D.,
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On 8th March 1933, a short cist was exposed in a field on the croft of Mr James Forbes, South Clunes, Kiltarlity, near Kirkhill, in the Beaully district of Inverness-shire.

A small gravel-pit had been opened, and while engaged levelling this Mr Forbes noted a hollow sound, and on investigating came upon several stone slabs; on raising these, a short cist was uncovered, on the floor of which lay the remains of a skeleton and an urn. Mr Forbes removed the urn to his house, left the bones undisturbed, and replaced the cover-stones.

Fortunately Dr W. J. Leach, Beaully, was visiting at the house and, recognising the importance of the find, arranged that the cist be kept untouched until a more careful examination and record should be made.

On 11th March, Dr Leach and I visited the site, and, with the willing assistance of Mr Forbes, uncovered the cist and obtained a record of the find.

The site of the interment was in a gravelly ridge in a field to the south-west of the farmhouse, at an elevation of 500 feet above sea-level, a situation that commands an extensive view. A short distance to the north-east of the house is a cairn roughly built of stones and in the shape of a horseshoe.

The covering stones of the grave lay at a depth of 2 feet from the surface of the ground. The cist was rather rudely made, roughly rectangular, and with its main axis lying nearly north-east and south-west; it was covered by five irregular flat stones, varying in size from the smallest measuring 17 inches in length, 16 inches at greatest breadth, and 3 inches in thickness, to the largest measuring 36 inches in length, 26 inches in breadth, and 5½ inches in thickness. Around the grave were a number of rounded boulders.

The internal dimensions were 3 feet in length on the north-west side, 2 feet 10 inches on the south-east side, 1 foot 6 inches in breadth at the north-east end, 1 foot 9 inches at the south-west end, and 1 foot 3 inches in depth. The cist was formed of six slabs set on edge, one at each end, and two on each side; the two slabs forming each

side overlapped and diverged so that near the middle of the cist the widest part measured 2 feet 2 inches across.

The slabs were irregular in shape and varied from 3 to 5 inches in thickness. All were of micaceous schist and probably were obtained from the site of a quarry some 300 yards distant. The floor of the cist was formed of coarse gravel and showed no indication of paving.

The skeleton was much decayed, there remained only the right half of the skull, six imperfect ribs and vertebræ, pieces of arm and limb bones, and two pieces of a male pelvis. The body had lain in a



Fig. 1. Profile view of Skull from Short Cist, Kirkhill, Kiltarlity, Inverness-shire.

contracted position on its left side facing south-east, with the head at the north-east end; the urn lay at the north-west side behind fragments of the pelvis.

The bones are in a fragmentary condition, but are those of a young man of medium build and about twenty-five years of age. The skeleton is represented by the right half of the skull with a piece of lower jaw; also fragments of three vertebræ, of six ribs, of a right shoulder-blade and humerus, of a right pelvic bone, and of shafts of right femur and tibia. The piece of pelvis shows male characteristics.

Fully more than the right half of the skull is intact so that it is possible to obtain the measurements detailed in the table. The transverse diameters are approximate, being arrived at by doubling the measurements taken from the median plane. The cranium is of

medium size with walls of medium thickness and a cubic capacity of approximately 1450 c.c. The sutural lines of the vault are all open, and the teeth are very perfect and show little signs of attrition. The skull is relatively short and broad, being *brachycephalic* with a length-breadth index of 84.8.

The profile view (fig. 1) shows a skull somewhat low, with root of nose depressed, a full frontal region and flattened occiput. The face is short and relatively broad, orbit large and rectangular, the nasal



Fig. 2. Beaker from Short Cist, Kirkhill, Kiltarlity, Inverness-shire.

aperture of medium width, on the whole features characteristic of skulls from short cists.

The beaker (fig. 2) is perfectly intact and is formed of a hard light-brown clay. It measures from $6\frac{1}{2}$ inches to $6\frac{1}{2}$ inches in height, 6 inches in diameter at the mouth, $5\frac{1}{2}$ inches at the neck, $5\frac{1}{2}$ inches at the bulge, and $3\frac{1}{2}$ inches across at the base; the average thickness of the wall is $\frac{3}{8}$ inch and the capacity is 63 fluid ounces.

The outer surface is decorated with three zones of ornamentation, one round the rim $1\frac{1}{8}$ inch broad, another round the shoulder $1\frac{3}{8}$ inch broad, and the third round the lower part $1\frac{1}{8}$ inch broad. The uppermost zone of ornamentation consists of a narrow band of vertical

impressions bordered above and below by four parallel horizontal lines. The middle zone consists mainly of a vertical zigzag of three parts bordered above and below by two and three horizontal lines. The lowest zone shows a band of horizontal impressions bordered above and below by two and three horizontal lines.

The proprietor, Lord Lovat, of Beaufort Castle, Inverness-shire, has presented the contents of the cist to the Anatomy Museum, University of Aberdeen.

Measurements in mm. of Skull from Short Cist at Kirkhill,
Kiltarlity, Inverness-shire.

Sex	Male	Alveolar length	41
Cubic capacity	1450 c.c. ap.	„ breadth	62 ap.
Glabello-occipital length	171	Sagittal arc, 1	122
Ophryo-occipital length	168	„ „ 2	111
Nasio-inionial length	162	„ „ 3	105
Minimum frontal breadth	108 ap.		338
Maximum frontal breadth	114 ap.	Length foramen magnum	38
Parietal breadth	145 ap.	Transverse arc	300 ap.
Basibregmatic height	124	Circumference	501 ap.
Auricular height	110		
Biauricular breadth	128 ap.		
Basinasal length	90		
Basialveolar length	88		
Nasialveolar height	70		
Orbital height, R.	37		
„ breadth, R.	41		

Indices.

Length-breadth	81.8
Length-height	72.5
Gnathic	91.7
Orbital, R.	90.2

IV.

A NEW ANALYSIS OF THE EARLY BRONZE AGE BEAKER POTTERY OF SCOTLAND. BY MARGARET E. CRICHTON MITCHELL, M.A., Ph.D., F.S.A.Scot.

This paper aims at a new analysis of the Early Bronze Age Beaker Pottery found in Scotland. A typological study of the pottery will be combined with the geographical distribution of all known examples. The problem for elucidation is to determine the nature and direction of the invasion which introduced this foreign pottery to Scotland, and the lines of penetration whereby it was disseminated over the country.

The late Lord Abercromby was a pioneer in the study of the beaker pottery of Great Britain.¹ It will be necessary to summarise briefly his conclusions as representing the orthodox opinion on the subject. Abercromby recognised three distinct varieties of beaker. Type A is characterised by a low globular body separated from the high upstanding neck by a marked constriction. The lip is not recurved and the base is flat. In general the constriction between body and neck cuts the vessel at half its total height. The salient features of Type B are radically different. There is no marked constriction between body and neck, the profile of the vessel from lip to base presenting a continuous curve. The globular portion is well-rounded and low-set, while the lip is strongly recurved. Compared with Type A, vessels of this category are superior in quality, the clay is fine, often bright red in colour, and well-fired. A third, Type C, is derived by a process of degeneration from the original Type A. The marked constriction is lost, the globular portion tends to rise relatively to the total height of the vessel, and the neck, no longer nearly vertical, begins to develop a tendency to recurve at the lip. In Scotland, Type A is scarcely represented; Type B is rare; while Type C is predominant.

Abercromby indicated the Rhineland as the immediate source of all British beaker ware, and designated the particular Rhenish pot which formed the prototype of the British series as itself a hybrid. This hybridisation was due to the amalgamation of two distinct ceramic traditions; those of the bell-beaker and of the late neolithic corded ware of northern Europe. The former, originating in Spain,² was disseminated

¹ Abercromby, *Bronze Age Pottery of Great Britain and Ireland*, Oxford, 1912, vol. I.

² Following the argument of Castillo, *La Cultura del Vaso Campaniforme*, Barcelona, 1928, rather than the hypothesis of Peake and Fleure, *Journ. Roy. Anthro. Inst.*, vol. ix. (1909).

throughout Europe by a brachycephalic and warlike people who had a rudimentary knowledge of metallurgy; the latter was the property of an equally warlike but dolichocephalic race who made stone battle-axes and probably emigrated from the South Russian steppes. As to the invasion itself, Abercromby visualised a single landing or series of landings at some point on the southern or southeastern coast of Britain. Thence the invaders and their pottery gradually permeated the whole island. With regard to Scotland, the beaker invasion entered the country from northern England by way of the coastal margins. On the east the way is obvious. On the west Abercromby was ready to postulate three possible lines of advance. The Lancashire and Cumberland coasts formed one route leading to southwestern Scotland, and even the sea route from North Wales may have been followed. A third possibility was an east to west movement through the Tyne Gap from Northumberland to the head of the Solway Firth. It is of interest to note that Abercromby regarded the western penetration as chronologically earlier than the eastern movement.¹

Since the publication of Abercromby's work much new material has accumulated, and this renders inevitable the criticism of his conclusions. In particular, his typology calls for revision. Types A and B remain, but Type C and the several subtypes must be abandoned. Theoretically the degeneration processes of Type A may have been as follows. The first feature to suffer in the event of careless manufacture would be the sharp constriction between body and neck. In place of a definite angle there would develop a curve. Thereafter the globular portion tends to diminish and at the same time to rise; it being technically more difficult to make a pot with a swelling near the base than to elevate the globular portion to the middle height. But such an outline calls for a recurved lip in order to balance the profile. By the time this is achieved the resultant pot is very similar to Abercromby's Type C. But Abercromby reckoned without the possibility of a degeneration of Type B. Here the first stage would probably take the form of diminishing and simultaneously raising the globular portion for the same technical reasons as in Type A. But the lower and wider the globular portion of the pot the more accentuated must be the recurved lip. Accordingly, when the globular portion is diminished and elevated the lip begins to straighten. In short, the degeneration processes of both A and B tend to produce similar results. Thus, Abercromby's Type C beaker could in theory be derived from either A or B. Excluding for a moment a few anomalous hybrids, the investigator who handles a large number of examples gradually reaches a tolerably firm conviction as to the origin,

¹ Abercromby, *loc. cit.*, p. 83.

A or B, of each degenerate type. This conclusion being partly of a subjective character cannot be more emphatic, but of its final validity there can be no doubt. In this connection a new nomenclature is suggested for British beaker pottery. Abercromby's two fundamental categories should remain, but in place of his Type C and the other secondary varieties, those not falling under the head of either A or B should be designated C_A or C_B , the original source being indicated by the suffix. Incidentally the designation B should apply only to such beakers as are similar in profile with the example found in Aberdeenshire, Abercromby, No. 225. Likewise A should be retained for beakers having a profile similar to Abercromby's No. 57 from Rusden Low, Derbyshire. Yet there remains an almost insurmountable difficulty. A and B are distinguishable; likewise the degenerations from each which tend to merge into a third type C. But in theory a crossing of the two pure strains A and B would produce a hybrid extremely difficult to distinguish within the composite category of C. And what of the other cross-breeds $A(C_B)$, $B(C_A)$, and $(C_A)(C_B)$? From a biological point of view the mixing of a pure with a degenerate strain is sterile, while the crossing of two degenerate strains would produce a freakish anomaly. Without stressing the above argument it may be stated that the divergences between A and C_A are so great that it would be extremely difficult for a potter to blend their characteristics, and the same applies to a possible amalgamation of B and C_A . As for $(C_A)(C_B)$ the biological argument is probably adequate explanation.

From the evidence detailed below it will be found that Abercromby's hypothesis with regard to a single landing or single point of disembarkation must now be abandoned. As long ago as 1915 Sir Arthur Keith wrote:¹ "The southeast of England was apparently only one of the landing-places, Eastern Yorkshire was another. The counties which bound the Firth of Forth formed another centre of the invasion." It is now recognised that the whole of the east coast of Britain from the Thames to the Dee was subjected to a series of incursions.

Abercromby dealt with 109 examples of beaker pottery from Scotland. The present paper includes the consideration, not only of these, but also of 160 additional examples not mentioned by Abercromby. It is to be noted, however, that the provenance of the additional urns is not significantly different from that of Abercromby's examples. Thus, while the distribution problems which have now to be attacked are similar and parallel to those investigated by Abercromby, the data at our disposal are much more ample. A general survey emphasises the markedly coastal and valleyward distribution of the pottery, and this,

¹ Keith, *Journ. Roy. Anthro. Inst.*, vol. xlii, (1915).

taken as an isolated phenomenon, tends to indicate penetration from the sea.

In the extreme southeast of Scotland there are two notable groups of beakers, those clustering along the banks of the Blackadder and the Whiteadder and the scattered group extending from Edgerston to Kelso at the junction of the Teviot and the Tweed. No. 135¹ from Edington Mill, Chirnside, is represented by a mere fragment of fine red comb-ornamented ware. It was recovered from a cist which also contained a food-vessel. Such an association argues a relatively late date for the beaker sherd did the evidence not argue that the cist had originally contained a beaker burial which had been disturbed by the intrusive food-vessel. The cairn which had once covered the cist had been broken down and dispersed, while the inhumed body of the primary interment had been scattered and was incomplete. It is worthy of note that the feathered edging seen on the ornamentation of this sherd occurs again on the beaker, No. 129, found near the gate of Manderston House. The fragments, No. 133, from Gruneldykes, near Duns, were found in a cist together with the unburnt skeleton of a male whose cephalic index was 82.6. The ware is very similar to that of the Edington Mill fragment. The remaining urns of this group, with the possible exception of No. 132 from Macksmill, Gordon, belong to the C_A category. The urn from the gate of Manderston House has an ornamental motif in the form of the zigzag with an abnormally long middle stroke which recalls similar decoration on the very fine C_A beaker, No. 136, from Harelaw Hill, Chirnside. No. 134 from Broomdykes, Edrom, has an entirely anomalous decoration, whose tendency to metopic arrangement finds no immediate parallels. The urn from Macksmill, Gordon, may be a C_B beaker, but is an outlier to this group in both form and ornament. Though the evidence cannot be claimed as conclusive, this group along the banks of the two main tributaries of the Tweed does appear to be homogeneous. Furthermore, from the character of the distribution it would seem to owe its origin to penetration inland from the mouth of the river.

The more southerly group comprises seven examples. No. 263 consists of five fragments from a cairn on Edgerston Moor. The ware is buff-coloured and the long zigzags may bear some relation to similar ornament on a C_B beaker, No. 261, from Littleton Castle at Kelso. No. 267 from Lanton Tower, near Jedburgh, is a fine specimen of a C_A beaker which was found in a short cist together with an unburnt skeleton, flint scrapers, and some white quartz pebbles. The ornamentation, however, is not significant with the exception of the triple outlined triangles near the base, which occur again on No. 260 from

¹ Numbers refer to the appended Catalogue.

Eckford, and in a degenerate form on the urns, Nos. 265 and 266, from Friars and Edenmouth, both near Kelso. The combination of comb technique with plain incision which is such a feature of the Eckford beaker can be likewise paralleled on the urn from Friars, Kelso.

In the two Scottish groups just described there are certain characteristics of which some are individual traits, while others are common to both. It is thus necessary to search for significant parallels to the more prominent motifs of these two groups, with a view to tracing the source of the beaker pottery in southeastern Scotland, and at the same time determining whether the features in common indicate direct contact between the two areas or simply a single derivation. From a geographical point of view, while the Edgerston-Kelso group surely penetrated directly across the border by way of Carter Bar, the Blackadder group seems to owe its origin to penetration from the mouth of the Tweed. Immigrants entering Scotland at Carter Bar would naturally follow the valleys of the Jed Water, the Teviot, and the Kale as far as Kelso; but there is no apparent reason why, having reached Kelso, they should not continue their way down the Tweed rather than cross the watershed to gain the unknown headwaters of the Blackadder on the bleak moorlands of the Merse. On the other hand, immigration by the estuary of the Tweed might easily be drawn to the exploration of the first tributary on the northern bank. Accordingly, geographical distribution does not support any direct contact between the two groups under consideration; but there are several ornamental motifs common to both areas. The zigzag with the abnormally long middle stroke occurs not only on the Manderston and Harelaw urns in the northerly group, but also on No. 262 from Wester Wooden Farm, Eckford. The feathered edging on the Manderston urn and on the Edington Mill fragment occurs again on the beaker from Edenmouth. Finally, the hanging triangle, which is found on four examples from the southern group, occurs in the north on the beaker from Harelaw Hill, Chirnside. It seems most reasonable to conclude that the two groups have a common source in northeastern England. The Manderston urn might have been made by the same potter as fashioned the example from Amble in Northumberland, Abercromby, No. 161A. The curious beaker from Eckford, though not completely paralleled by any English example, finds possible prototypes among the numerous Yorkshire beakers which show hatched and open triangles. Meanwhile the origin of the feathered edging is to be found on certain Northumberland urns, particularly Abercromby, No. 183, from Norham. No convincing parallels are forthcoming in support of the idea that the

southeast Scottish beakers are in any way the result of direct communication with continental Europe.

Though a double line of approach has been suggested for south-eastern Scotland, other explanations of the distribution as known at present are equally possible. Penetration by land along the coastal margin is as reasonable as mariners sailing up the Tweed. Similarly, the valley of the Till was probably utilised as an avenue of approach in conjunction with the route over Carter Bar. But if every possible line of approach were explored the result would be a confused and erroneous conception, since the distribution is certainly not complete. It appears safer to indicate the most rational explanation of the grouping of examples in any given area, to point out the fallacies of routes which run counter to reason or geographical features, and to leave other possible avenues of approach open until a more complete distribution is available for investigation.

From the moorland above Pease Bay, near the modern village of Cockburnspath, two beaker urns were recovered from the same cist which had been buried at the base of a pit excavated beneath a cairn. The ornamentation on the C_B example, No. 131, is exactly paralleled for five bands by that on a beaker of the same type from Woodhorn, Northumberland, Abercromby, No. 160. Even the profiles are remarkably similar. But if this Cockburnspath beaker has associations with Northumberland it also bears some relationship to the northern group in Berwickshire. The fragment from Grueldykes, near Duns, exhibits a five-lined chevron, five horizontal bars, and a heavy band of cross-hatching in exactly the same sequence as on the Cockburnspath beaker. But the problem of contact is complicated by the fact that the multiple lined chevron is also a marked feature of certain Dutch beakers.¹ It is difficult to give an adequate interpretation of this parallelism, though it seems possible that the Grueldykes and Cockburnspath beakers themselves originate from a Dutch penetration of northeastern England.

One of the most remarkable concentrations of beaker ceramic in Scotland is to be found along the southern margin of the Firth of Forth. Three domestic stations are known within 10 miles of each other; at Hedderwick on the estuary of the Tyne, at North Berwick, and at Gullane. Both the latter are situated on the projecting headland of East Lothian. Sir Arthur Keith suggested that from this area there was direct communication with the continent of Europe, and the possibility of establishing such contact on the evidence of the ornament displayed by the Scottish beaker sherds is a question of great interest. From Gullane and North Berwick string-marked fragments of pure B

¹ Bursch, *Die Becherkultur in den Niederlanden*, Marburg, 1933, Tafel II. 6, 8.

type have been found, while from a sand-pit near Bathgate in the valley of the Almond two complete and beautiful examples, Nos. 274 and 275, of this category were recovered. As far as can be ascertained no such ceramic has yet been found in northeastern England. Even farther south only debased examples appear,¹ with the exception of a notable group within the area covered by the modern counties of Wilts, Dorset, and Somerset. The lack of any immediate prototype for the East and West Lothian B ware strengthens the theory that it is evidence of a new penetration direct from the Continent. But the beaker ceramic from the Netherlands and the Central Rhineland does not afford any very close analogies. Wholly string-marked beakers are rare, and the fine texture and brick-red colouring of our Lothian sherds are not easily paralleled abroad. Moreover, with a few notable exceptions in Holland, the striking contour of the British B beaker is not to be found elsewhere in Europe unless among the pure bell beaker ceramic of Spain and Portugal.

It is even more difficult to indicate the origin of the C_A sherds from the burials and domestic stations of the Lothians. If they too were deposited by continental invaders, did the latter achieve any amalgamation with the southeastern lines of beaker penetration? At the domestic site of Gullane it is interesting to note that B and C_A sherds may have been segregated; but, as the segregation takes the form of two kitchen-middens in the same ravine and only fifty yards apart, the respective potters, provided they synchronised, must have been on at least friendly terms. On the other hand, there is no B ware from Hodderwick where the C_A sherds were mixed with neolithic Type B pottery; a combination which may be significant in view of the finds at Peterborough and West Keal in Lincolnshire. Continental analogies to the C_A ornament of the Lothians are not very helpful. Horizontally filled triangles occur on the sherds from Gullane. On beakers from the Central Rhineland examples of similar decoration can be cited. In particular, on two beakers, one from Andernach and the other from Urmitz, both in the museum at Bonn,² there appears immediately below the lip a double row of horizontally filled triangles whose apices coincide but are oppositely directed. These triangles are separated by a double horizontal line encircling the pot. An exactly similar scheme is found immediately below the lip of the C_A beaker, No. 231, from

¹ In *Proc. Prehist. Soc. East Anglia*, vol. vi, p. 356, J. G. D. Clark has published the beaker pottery in the Ipswich Museum. Among the urns illustrated is an example from Branham Farm, Suffolk, pl. xxviii, fig. 5. Though the swelling on this vessel lies relatively high compared with the total height, and though the ornamentation is not in the best tradition, the profile approximates very closely to that of a pure B beaker.

² Castillo, *loc. cit.*, pl. xcii. 1, pl. xciii. 3.

Cakemuir Hill, near Borthwick. Several parallelisms can be quoted from among the Dutch beaker ornament, though the absence there of the broad horizontally filled triangle is worthy of note. On the beaker, No. 152, from East Barns, a prominent motif is the band of dashes arranged alternately. This is found recurring on several beakers from Holland, notably on an example from Hillegom in the northwest province,¹ and also on a beaker from Houtdorper Veld in the Veluwe district.² In profile, the former of these two urns approximates closely to certain southeast Scottish types. Rows of chevron ornament have already been noted on the Cockburnspath beaker; they recur on No. 153 from Windy Mains, near Humbie, and on No. 232 from Cakemuir Hill, Borthwick. In Holland the ornament is a favourite one and is seen on many beakers, notably on two beakers from Uddelermeer³ and on one from Oostereng.⁴ But having respect to the ultimate criterion of form the Netherland parallels are manifestly of little value.

There remains the possibility that the Lothian beaker ornament can be derived from the penetration which colonised southeastern Scotland. The horizontally filled triangles on the fragments from Gullane, on the beaker, No. 155, from West Links, North Berwick, and on the CA urns from Juniper Green, No. 230, and Cakemuir Hill, Borthwick, No. 231, might conceivably be traced to the similar ornamentation on the urn from Harelaw Hill, Chirnside. Still, it must be admitted that the Berwickshire example is just as likely to be the result of a reflex movement from the shores of the Firth of Forth; in which case the problem of the origin of the ornament is no nearer solution. Exactly the same argument applies to the metopic decoration on the West Links beaker already mentioned. It might be related to the curious vertical columns on the Edrom beaker in Berwickshire; while either or both may be a debased reflection of the heavily ornamented metopes of the Dutch and Rhenish beakers. The occurrence of feathered edging, however, helps towards a solution of the problem. This distinctive motif occurs on the beaker from East Barns, on the fragment from Windy Mains, Humbie, and on the two beakers from Cakemuir Hill, Borthwick. It has already been noted how frequently the feathered edging is found on the Roxburgh and Berwickshire beakers. Similarly, the zigzag with the abnormally long centre stroke is found on the Windy Mains urn and on the fragmentary beaker, No. 188, from Broxmouth Waird, near Dunbar. It is just possible, however, that this ornament has a continental origin. It is a motif which is not likely to be original; it is not the immediate creation of the artist; it

¹ Bursch, *loc. cit.*, Tafel III. 10.

² *Ibid.*, *loc. cit.*, Tafel II. 5, 6.

³ *Ibid.*, *loc. cit.*, Tafel III. 3.

⁴ *Ibid.*, *loc. cit.*, Tafel II. 8.

is a step in the degeneration or misunderstanding of a straightforward design. Among the Dutch beakers there is an example from Winter-swijk on the eastern border of Gelderland¹ which is ornamented by bands of herring-bone incision separated by long vertical strokes. It is an easy transition to combine these two ideas and evolve the zigzag with the abnormal centre line. But the closest contact between the Lothians and the southeastern Scottish groups is shown on the fragment of the second urn from Windy Mains. The quintuple outlining of the hanging triangle combined with the feathered edging is the duplicate of the ornament close to the base of the urn from Edenmouth, near Kelso.

The Blackadder group, the Edgerston-Kelso group, and the Pease Bay urns have their roots in northeastern England. The B ware from the Lothians is a foreign intrusion which cannot for the moment be interpreted. The C_A beakers of East and West Lothian have continental affinities which, allied to the character of the distribution in this area, make direct contact with the Continent more than a possibility. On the other hand, influence from the primary southeastern groups is well attested. Yet the extent of this influence is difficult to gauge, and an intimate study of the pottery and its associations leads to the conclusion that it was quickly dissipated and had little part in the florescence of the Lothian beaker culture. The urns from East Barns, Boglehillwood Longniddry, and Humble appear to be the final productions of a movement whose force is spent, rather than the vanguard of an energetic penetration.

Before leaving the Lothian beakers it is questionable whether they owe their provenance, provided they have connections with the southeastern groups, to beaker folk crossing the watershed of the Lammermuirs and following the valleys of the Water of Leith, the Tyne, and the Esk; or whether the immigrants came by way of the coast and the sea. The watershed of the Lammermuirs is not a formidable barrier to penetration, but taking into consideration the obvious simplicity of the coastal route this latter seems the more likely.

The Forth and Clyde isthmus has now been reached and the problem of the beaker distribution becomes complicated by the possibilities of contact with the west; geographical reasons having so far, with the exception of the Tyne gap in northern England, rendered unlikely any intercommunication. Before proceeding farther north therefore the southwest Scottish group calls for interpretation.

The modern counties of Wigtown, Kirkcudbright, and Dumfries are curiously barren of beaker finds. With the exception of an extensive

¹ Bursch., *loc. cit.*, Tafel I, 4.

domestic site on Glenluce Sands at the head of Luce Bay, only four beakers are known from the area. From the very inadequate description it is impossible to identify either the type or the character of the ornament on No. 284 from near the ruins of Carsecreugh Castle; this is the more unfortunate as the burial, that of an infant with a brachycephalic adult female, was one of particular interest. No. 224 from Woodfield, Highbanks, though in good preservation does not possess very characteristic decoration; the alternation of oblique and horizontal lines being of such frequent occurrence as to lack significance. It is interesting to note, however, that a beaker in many respects similar was found at Moel Hebog, Snowdonia, Carnarvan.¹ The lozenge pattern on No. 151 from Auchencairn, Closeburn, in the valley of the Nith, is difficult to parallel outside the area. The nearest analogy is Abercromby's example, No. 152, from Folkton in the East Riding of Yorkshire. But the resemblance is misleading since the profiles of the respective vessels are totally different, while the size and disposition of the lozenge pattern are quite dissimilar. From Stoneykirk, near the settlement site at Glenluce, the lip of a beaker, No. 278, was found protruding from a patch of sandy gravel. On removal the pot was found to contain small perforated disc-shaped beads of lignite. The urn itself fell to pieces with the exception of the rim, but it appears to have been ornamented with an elongated lozenge pattern which possesses a striking parallel in a pseudo-cinerary urn from near Oban.² Finally, from Glenluce, besides fragments of both types of neolithic ware, much B beaker ceramic has been recovered. Like the similar pottery from East Lothian it is string-marked, while the clay is bright red, well-fired and thin.

There are three possible avenues of approach to the southwest: from the east by the Tyne Gap in northern England; from the north; or directly by land or sea from the south. Abercromby favoured the first of these alternatives, and from a purely geographical standpoint his argument is difficult to combat. But if the Tyne Gap is the line towards the colonisation of the Solway Firth and its adjacent coasts, why should the beaker distribution in that area be so markedly western in its provenance? There are no beakers from Dumfriesshire with the exception of the Auchencairn urn. In a map, prepared by the late Professor Boyd Dawkins,³ of conjectural prehistoric woodlands in southwest Scotland the whole length of the Tyne Gap is marked as densely afforested. Moreover, the head of the Solway Firth must have

¹ *Bulletin of the Board of Celtic Studies*, vol. 1. part 2, May 1922.

² *Proc. Soc. Ant. Scot.*, vol. lxxvi. p. 407.

³ Fleure and Whitehouse, *Arch. Camb.*, vol. xvi. (1916) p. 101.

been surrounded by marsh-land which would prove an effective barrier to prehistoric migration.

The route from the north is an interesting possibility and deserves most careful consideration. Nos. 246 and 247 are two beakers from a cairn near Drummelzier. No. 247 was a scarcely distinguishable fragment, but No. 246 was a well-made urn of a degenerate B form. The ware is reddish brown and fine in texture, while the ornamentation is that of continuous string-markings from lip to base. Though the swelling of the vessel is placed low in relation to the total height, the lip is straighter than in vessels of the pure B category, while the small size of the Drummelzier pot indicates inferior taste and workmanship. The nearest prototype to this vessel is the B ware of either East Lothian or Glenluce. In view of this suggestion it is interesting that type B neolithic ware also occurred at Drummelzier. But if the Drummelzier beaker is related to Glenluce the problem of the origin of the southwest Type B beaker ceramic is no nearer solution. On the other hand, if the Drummelzier example were somehow derived from East Lothian then it might represent an intermediate link between East Lothian and Glenluce. A northern connection for the beakers at the headwaters of the Tweed is made possible by the ornament of a C_A beaker, No. 245, found at Oliver, Tweedsmuir. This vessel bears two zones of incised diamond design, which in one instance has a quadruple outline. The lowest band consists of wide triangles filled by vertical lines.¹ The triangular ornament also occurs on No. 228 from Crawford, where the horizontal filling is identical with similar decoration on the East Lothian C_A beakers. Finally, the bronze ring discovered with the Crawford urn is paralleled by a ring whose provenance at Stobo, near Peebles, lies on the direct route northwards via the Tweed valley and the pass through the Moorfoot Hills by Eddleston.

If, then, the group of beakers at the headwaters of the Tweed is the result of penetration from the shores of the Forth, and if they indeed form an intermediate link with the southwest, then the diamond pattern on the Auchencairn beaker may be derived from Oliver, Tweedsmuir. The idea of any movement in the opposite direction—that is to say, the idea of deriving the group around the headwaters of the Tweed from the southwest—is negatived by the parallelisms just quoted from East Lothian.

The route from the south is supported by two facts: the similarity

¹ There is no fundamental difference between filling a triangle with vertical or horizontal lines. The direction is dependent upon the position of the pot during the process of ornamentation.

between the Woodfield and the Moel Hebog urns, and the disposition of the southwest Scottish finds. The latter seem to have belonged to a maritime folk who, coasting along the southern shores of Galloway, explored in turn such rivers as the Nith and the Dee whose broad estuaries would tempt that spirit of curiosity which seems to have been one of the characteristics of beaker man. This southwestern line of approach will receive further consideration when the more northerly parts of the west Scottish coast come under discussion.

From a geographical point of view the southern avenue of approach to southwestern Scotland seems the most feasible. From a typological study of the pottery involved there is every reason to support the theory of a penetration from the north. The question must remain open.

Along the western shores of Scotland from Ayrshire to the island of Lewis, beaker ceramic is found sporadically. Yet, however scattered, the several examples have a certain homogeneity which makes it desirable to consider them as a single series. Within the composite whole, however, isolated groups such as those from Muirkirk and Poltalloch must receive individual consideration.

From the northwest of Ayrshire, practically opposite to the island of Bute, come two beakers of great interest. At the Court Hill, Dalry, there was found an urn, No. 99, of C_B variety ornamented by an anomalous series of oblique, vertical, and horizontal strokes. From the point of view of typology its derivation from a pure B prototype is quite evident. About 20 miles farther north along the coast on the estate of Haylee, near Largs, a beaker, No. 110, of pure B type was recovered from a cist. Though typologically this urn falls within the B category its ornament is unique and without parallel in this class. The closest analogy to the decoration is to be found on a beaker of C_B form from near Glen yr afon House, Llanblodwell, Denbighshire, North Wales.¹ This resemblance strengthens the theory already suggested by the finds in Galloway of a southern beaker penetration into southwestern Scotland.

In 1923 there was discovered within the Roman fort of Old Kilpatrick, near Dumbarton, a curious stone-lined grave which contained fragments of three different vessels. Two fell within the category of neolithic pottery, one of them bearing a strong resemblance to the sherds of neolithic Type B ware from Glenluce and Hedderwick; the third was similar to beaker ceramic. On account, however, of the different quality of the clay and the rather straighter line of the wall Dr Callander has assigned this sherd to the Overlap Period. Though the Old Kilpatrick

¹ *Bulletin of the Board of Celtic Studies*, vol. 1, part 2, May 1922.

fragment is thus disappointing from the point of view of an analysis of beaker distribution, the mouth of the Clyde must have been very tempting to a pioneer folk with a penchant for exploration. Whatever urns may still await discovery in the lower reaches, there is no lack of beaker evidence from the upper reaches of the river. From Mossplat, near Carluke, there comes a beaker. No. 225, whose profile would have placed it within the A category were it not so carelessly made. Its ornament, however, is of great importance since the same sequence of cross-hatched and vertical lines can be traced through Fife and Angus as far north as Aberdeenshire. South of Lanarkshire there is no parallel to the ornamentation. Is there here the birth of a spontaneous motif or is it due to the penetration south of the Forth of a foreign motif, which became the vogue north of the estuary? Among certain Dutch beakers' alternating bands of vertical lines and cross-hatching, bounded above and below by a single horizontal line encircling the vessel, are frequent. Though this scheme bears a certain similarity to the sequence on the Mossplat beaker the intervening plain zones constitute a difference which may be fundamental. For the moment the decoration on the Mossplat beaker must be regarded as genuine native artistry which had the good fortune to become popular beyond the confines of Lanarkshire.

Two beakers, Nos. 226 and 227, found in a sand-pit on Lanarkmoor are of particular interest. The principal decorative motifs of the former are the horizontally filled triangles and the feathered edging, both of which are so characteristic of the urns from the eastern counties south of the Firth of Forth. Geographically, penetration of this Clydesdale area from the north would be feasible *via* the valleys of the Medwyn and the Lyne. The second beaker from Lanarkmoor is totally unlike the first and displays affinities which point west rather than north or east. The potter who made this vessel had a confused idea of two radically different ornamental schemes. The first was a series of horizontal bands encircling the pot and forming zones; the second was the division of a zone into a number of metopes by vertical lines placed at intervals. The zonal ornament used was the same type of cross-hatching as occurs on the Mossplat beaker. But for the decoration of the metopes the potter had only a very rudimentary idea, for she packed the divisions with motives suited primarily to a zonal scheme: herring-bone, cross-hatching, chevrons, and oblique strokes. The result may be an interesting study in psychology, but it is not an artistic production. Whence could the metopic ornament have penetrated to the mid-reaches of the Clyde? Possibly it may have filtered through from East Lothian, but considering the lack of intermediate examples

¹ Bursch, *loc. cit.*, Tafel II. 1, Tafel III. 2, 6.

and the fact that in East Lothian only a single occurrence is known, such a derivation is improbable. But a debased form of the metope occurs on the Haylee beaker from Largs. The probability of contact between the upper reaches of the Clyde and the coastal margin of Ayrshire is supported by the fact that the cup- and ring-markings which adorned the cover of the cist containing the fragments of No. 229 from Wester Yird Houses, Carnwath, can be closely paralleled with similar markings on the cover-stone of a cist at Coilsfield, near Tarbolton. The Coilsfield cist contained an early example of a food-vessel.

Two forces were operative near the headwaters of the Clyde. Influence from the Firth of Forth is established and may have been part of the movement which affected the group of beakers at the source of the Tweed. In a like manner influence from the west was active and it is probable that some at least of the folk who made this Clyde group of beakers had penetrated inland from the mouth of the river.

There remains to be considered the beaker settlement site at Muirkirk, in the uplands of central Ayrshire, Nos. 100-109. The primary importance of Muirkirk is the fact that excavation on the site proved the association of a developed form of hut-circle with not only beaker but Overlap pottery. Unfortunately the true beaker ware is represented only by fragments, among which there occurred string-marked pieces of fine reddish ware which are very similar to pure B ceramic. The Overlap pottery exhibits influence from Type B neolithic wares as is shown by the presence of characteristic pinched finger-tip ornament and the impressions of a hollow reed. It is unreasonable to suggest that Muirkirk was colonised from any other direction than the west. The following quotation is taken from the excavator's account of the prehistoric sites given to the *Proceedings of the Society of Antiquaries of Scotland* during the session 1926-7: "The district of Muirkirk is situated within the uplands of the central division of Ayrshire and on the upper reaches of the river Ayr. . . . It is surrounded on the north, south and east by hills rising, at their highest, to nearly 2000 feet. To the west the prospect is wide and open across the whole width of the county to the sea."

From the neolithic cairns of Glecknabae in Bute, Nos. 141-144, Dunan Beg, No. 137, and Giants' Graves, Nos. 138-140, at Whiting Bay on the east coast of Arran, fragments of fine red ware were recovered which, while analogous to beaker ceramic, has belonged to vessels somewhat smaller than the normal beaker urn. Some fragments are string-marked and bear a strong resemblance to B ceramic, while others, bright red in colour, exhibit cross-hatching which could only have been executed by beaker immigrants. Professor Bryce, in describing this pseudo-beaker

ware, remarked that it "represented a terminal phase in the Stone culture of Scotland, and provides a link . . . between the chamber culture and the short cist culture." Yet the fragments show all the characteristics of pure beaker pottery, with the exception of appearing to belong to urns rather smaller than a normal example. But the discovery from Drummelzier has shown how very small B beakers can become. There seems no reason, therefore, to object to these sherds being assigned to an Early Bronze Age context instead of placing them in an Overlap Period for which there is as yet very little evidence. The finding of a perforated stone hammer in the chamber at Tormore is proof, were such required, that the beaker folk had no objection to utilising the older sepulchres.

The beaker, No. 92, from a secondary cist in a segmented, chambered cairn at Balnabraid, south of Campbeltown, Kintyre, is a degenerate and clumsily fashioned urn of C_A type. The ornament has no significance beyond the fact that bands of cross-hatched lines are a prominent feature.

On the western shores of Coll and Tiree and at Sanna Bay, on Ardnamurchan Point, lie three important domestic stations. The fragments from Coll and Tiree are in the collection of Mr Ludovic Mann, at the Kelvingrove Museum, Glasgow. They are of a brilliant red colour decorated with string-markings, incised cross-hatchings, and pits made by the impression of a hollow reed. The latter ornament is of great interest, as it also occurs on pseudo-beaker pottery from Muirkirk, and is known on the fragments of neolithic Type B ware from Glenluce and Hedderwick. It is not a form of ornament in the beaker tradition. At Sanna Bay the kitchen-midden yielded fragments of string-marked beakers ornamented by a continuous spiral from lip to base.

Stretching from Corran Ferry down Loch Linnhe to Salen Bay, on the northeastern shore of Mull, is a group of four beakers now to be considered. From Callachally, Glenforsa, Mull, come two associated beakers. The first, No. 89, is a badly made urn of C_B type ornamented, however, by two important motifs. The first consists of horizontal, cross-hatched and vertical bands, set at intervals from lip to base; the other takes the form of triangles filled by a chevron design. Two rows of triangles set apex to apex encircle the pot at its widest diameter. The second urn, No. 90, is only known from a fragment. It is said to have been of "similar character but different in its ornamentation, which consists of angular scorings all over the surface and towards the top a band of triangular spaces alternately plain and filled with parallel lines." The bands of cross-hatched lines on No. 89 find analogies on other beaker urns from the west coast, notably those from Mossplat and

Balnabraid. The chevron hatched triangles on No. 89 and those filled by parallel lines on No. 90 are, however, a new feature in the west coast series. Their due significance will become apparent later, but at the moment attention should be directed to the filled triangle ornament on the following group of Glamorgan beakers:¹ (1) Newholm Farm, near St Fagan's Castle; (2) at Cwm Gar Farm, near Dolygaer Station north of Merthyr Tydfil; (3) at Merthyr Mawr Warren, near Porthcawl. No. 91 is represented by some fragments of horizontally string-marked beaker ware found in a cist deposited in gravelly soil by the shores of Salen Bay. Though the fragments are very small they are strongly suggestive of B ceramic. No. 203 from Corran Ferry beyond being a degenerate example of the C_B variety has unfortunately no distinctive ornament. The markedly broad band of cross-hatching, combined with the horizontally lined neck, and the general profile of the pot suggest, however, that its maker, originally wedded to B ceramic, was endeavouring to introduce the cross-hatched bands typical of the south-west Scottish C_A group. In any case the breadth of the cross-hatched area on the Corran Ferry beaker indicates that the potter had no realisation of the artistic value of such an ornament.

A most remarkable group of beaker urns is confined to a small area in the immediate vicinity of Poltalloch, a few miles southwest of the southern extremity of Loch Awe. Of seven different vessels represented, four are of unknown type, two belong to the C_A group and one is a C_B beaker. Of the C_A examples, Nos. 82 and 83 are well-made pots with quite dissimilar ornament. No. 82 has two bands of double outlined triangles horizontally shaded, while No. 83 is characterised by a band of horizontal zigzags joined by longer or shorter vertical strokes. The motif on No. 82 has already occurred in East Lothian and is known to have penetrated as far south as Crawford in Lanarkshire. Parallels have been suggested from northeastern England, and in particular Abercromby cited an example from Cursed Field, Ancroft, Northumberland. But the Poltalloch beaker has double outlined triangles. Such an ornament is not spontaneous nor is it related to the simple triangle. It is part of a degeneration process. The initial stage of that process must be sought amongst the south Welsh beakers already quoted in connection with the Glenforsa urn. Among the Glamorgan beakers it is clear that the potter is intent on achieving a plain chevron band which she seeks to emphasise by hatching the triangular spaces on either side. Naturally the apices of the triangles do not coincide. But unless the reason for this curious disposition of ornament is realised, the idea of the open chevron is immediately lost and the plain band

¹ *Bulletin of the Board of Celtic Studies*, vol. 1, part 2, May 1922.

degenerates into an edging for the filled triangles. The initial step can be seen in the beaker from Newholm Farm, near St Fagan's Castle. In the Poltalloch pot the triangles have so dominated the decorative scheme that the upper row has been left vacant so as to accentuate the horizontal lining of the lower row.

There seems therefore no doubt that many of the west Scottish beakers owe their provenance to maritime enterprise bearing Welsh influence. The Woodfield and Haylee urns are witness to such intercourse. Accordingly, there is no reason why the triangle with single or double outline should not have originated in the same quarter. In further support of this southwest route there may be mentioned a beautiful example of a C_A beaker from a cist at Baroose Farm, Lonan, Isle of Man.¹ The under part of this urn is decorated by pendant triangles not, it is true, double outlined, but horizontally filled. Furthermore, like No. 82 from Poltalloch, the margin of the triangular spaces is not a continuous line but a series of short dashes. It seems therefore that in accounting for the filled triangle ornament in west Scotland there is no necessity to invoke influence from East Lothian. But all possibility of such influence should not be entirely overlooked, for the C_{II} beaker, No. 86, from Poltalloch exhibits rows of alternate dashes, a sequence of decoration which can be paralleled on the urn from East Barns and even farther afield in Holland. Meanwhile the vertical strokes between zigzag borders seen on the second C_A beaker from Poltalloch is a form of ornament which can be traced from Stafford and the East Riding of Yorkshire as far north as Fyrish, Evanton, Ross-shire.

Recently four discoveries of beaker urns have been made on the southwestern coast of Skye. In 1929 Mr Lindsay Scott recovered fragments of two beakers, Nos. 204 and 205, from Kraiknish, on the shores of Loch Eynort. One beaker belongs to the C_A variety. The best-preserved example is covered by a very striking lozenge pattern, each figure possessing a double-edged outline. The character of the ornamentation and the profile of the vessel leave no doubt as to its derivation. Almost exact parallels are to be found among the Wiltshire beakers.² The ornament also occurs on beakers from Derby and Stafford, Norfolk and Suffolk. But in these areas, as well as farther north in Yorkshire, degeneration has set in. Attention has been diverted from the lozenge to the plain chevron bars which serve to outline it. The process is the reverse of that which took place in the case of the double-outlined triangle. It is a far cry from Skye to Wiltshire, but there is

¹ *Proc. Camb. Ant. Soc.*, vol. xxiv. (1921-2) p. 82.

² Particularly Abercromby, No. 8.

no ambiguity about the reality of the parallelism, and, in view of the possible Welsh contacts in western Scotland, finds from intermediate localities may be confidently expected.

In 1927 Dr Callander examined a short cist occurring as a secondary burial within a long cairn situated on the western shore of Loch Slapin, near Kilmarie Lodge. The cist yielded a C_A beaker, No. 209. The ornamentation is of extraordinary interest. Above the constriction lies a row of triple-edged chevrons, their apices pointing towards the lip. The space around them is filled by horizontal lines. The same ornamental scheme occurs close to the base. Encircling the pot at its greatest diameter is a row of open lozenges edged by two, sometimes three, lines, and, like the chevrons, surrounded by horizontal incisions. Analogous decoration occurs on the Glanrorgan beaker from Merthyr Mawr, Warren, near Porthcawl; while the lozenges find a distant echo in the Oban "Cinerary" urn, the Stoneykirk beaker lip, and the Auchencairn vessel.

In the autumn of 1931 Mr Lindsay Scott excavated another neolithic chambered cairn at Rudh' an Dunain on the shores of Loch Brittle. From the chamber he recovered fragments of a beaker, No. 211, which upon restoration was found to belong to the C_A category. The ornamentation is curious. The following description is from Mr Scott's account: "The waist and foot are plain; two similar bands of decoration cover the neck and body. These bands are defined by three parallel lines above and below, four lines at the lower edge of the upper band, and divided into a series of panels by sets of four to six vertical lines. Each panel is decorated by a series of short diagonal lines extending inwards and downwards from its right and left side. A series of similar diagonal lines hangs from the lower edge of the lower band of decoration." The essential feature is the metopic arrangement of the ornament. The profile of the vessel can be paralleled elsewhere on the west coast of Scotland, but not the decoration. The metopes on the Haylee and Lanarkmoor urns are totally different. Mr Scott suggests that the urn, No. 258, from Ross-shire affords the closest analogy so far as decorative motive is concerned. But he lessens the value of his suggestion by affirming that the maker of the Rudh' an Dunain beaker reached Skye from the mainland. A staunch believer in Abercromby's hypothesis of an east coast derivation for all Scottish C_A beakers, he will not countenance the possibility of a west coast penetration. But where on the immediate mainland of Scotland does Mr Scott find a prototype for his Skye beaker? The nearest beaker ceramic is between 40 and 50 miles distant, and even then neither the Sanna Bay ware nor the Corran Ferry urn are in the least analogous. But what of the

Ross-shire beaker? Though he does not state it as a fact, it is obvious that Mr Scott is toying with the possibility of deriving the Rudh' an Dunain ornament from the northeast of Scotland. But the Ross-shire potter is applying a typically A form of decoration to a degenerate example of B variety. It is improbable that the Rudh' an Dunain potter would stoop to copy a debased traditional ornament from a beaker of a totally different type. The ornamentation of the Rudh' an Dunain urn must therefore for the moment remain unique.

From the neolithic chambered cairns of Langass Barp and Geirisclett in North Uist there were recovered sherds, Nos. 206-208, of fine greyish ware which, on account of its texture and ornament strongly resembling beaker ceramic, has been designated Overlap pottery. Instances of such pseudo-beaker ceramic in neolithic sepulchres of the west coast of Scotland are so frequent as to render comment unnecessary.

No. 255, from the parish of Lochs, Lewis, is a beaker of unknown type and ornament from a short cist.

The pure B sherds from East Lothian and the complete urns of the same type from Bathgate are probably witness to an individual beaker element entering Scotland *via* the estuary of the Firth of Forth. There is evidence of the same movement at St Andrews, where a B beaker, No. 194, was found in a cist, on the settlement site at Tents Muir which has yielded many sherds of the same type, and near the head of the Earn valley where a fragment of this ware was recovered from beneath a cairn. Apart, however, from pure examples of the type, the influence of the B tradition on the beaker ceramic in the area bounded by the Firths of Forth and Tay is very marked. No. 276 from Tartraven has undoubtedly been influenced in this way. No. 250 from Pendreich, Bridge of Allan, has a debased B profile and the horizontal rows of incised lines at the neck are a poor imitation of the impressions of continuous string-markings. The curious metopic decoration on the body of this urn can be exactly paralleled on a beaker from Uddelermeer,¹ Holland, while the feathered edging at the junction of body and neck is worthy of note. B influence can likewise be traced in the horizontal incisions on the neck of No. 249 from Bailielands, Auchterarder; in the same feature on No. 251 from Kincardine Castle, and in the profile of No. 201 from Dunshelt.

The remaining beakers from this area, although they belong to the CA category, do not form a homogeneous group. From a geographical point of view the beakers in the valley of the Eden were deposited by a seafaring folk exploring inland from the coast. Yet none of the four examples bears the slightest resemblance one to another. No. 193 from

¹ Bursch, *loc. cit.*, Tafel III. 5.

Dairsie has been decorated by a potter who was thoroughly conversant with the artistic value of the metope. Furthermore, the incised ornament on this beaker has been deliberately enhanced by a white filling. Neither the ornamental style nor the technique employed on this urn can be paralleled at present from either the English or the Scottish east coast series. From a large cairn at Collessie Nos. 199 and 200 were recovered; the first from a cist at the centre of the cairn and the second from the bottom of an oval pit sunk in the subsoil. No. 199 is a C_B beaker whose only claim to attention lies in the possession of feathered edging on either side of the lower series of horizontal lines. No. 200 has a markedly C_A profile and its ornamental scheme is of outstanding significance. If this urn is closely compared with No. 232 from Cakemuir, Borthwick, the following arrangement of zonal decoration can be followed on both urns. Six bars of incised chevrons (five only on the Collessie urn); twelve horizontal lines (ten on the Collessie urn); feathered edging to this group; six horizontal lines feathered above and below; seven horizontal lines feathered above; and finally a band of long oblique strokes bounded by a single horizontal line below. Such parallelism is of the greatest significance. At another part of the Collessie cairn a second pit was found. This contained, among other objects, a bronze riveted knife-dagger. Such a relic properly belongs to the Scottish food-vessel complex, and its presence at Collessie must indicate one or two things. If the cairn represents a single burial ceremony, then the knife-dagger makes the urns relatively late in the Scottish beaker period. In support of this a similar pit was found at the Hagg Wood, Foulden, Berwickshire, beneath a cairn whose primary interment was associated with a food-vessel. On the other hand, the pits at Collessie may have been intrusive and later, but in view of the feathered edging on both urns this seems unlikely.

No. 223, the C_A beaker from Tillyochie, Kinross, might have been made by the same potter as fashioned the beaker from Mossplat in Lanarkshire, so identical are the respective ornamental schemes. Yet the profile of each vessel is so individual that contact, if it took place, can only have been indirect. No. 270 from near Stirling cannot be related to any example further south, although its filled triangles may bear some relationship to similar ornament on the East Lothian and Midlothian beakers. The remaining C_A beaker from Fife, No. 202 from Kinghorn, is an anomalous pot rudely ornamented by a triple incised chevron. It has no immediate parallel.

It has already been pointed out that the B beaker ware in the area under consideration is part of the B penetration of the Firth of Forth. It has further been suggested that this penetration was so virile in

Fife that it was able to influence the C_A beakers in the immediate vicinity. The corollary is that the makers of B ceramic were affecting an already existent population manufacturing C_A beakers. There remains to be determined the source of this C_A ware. The beaker from Dairsie is in the continental tradition, as is shown by the deliberate white filling and the character of the incised design. False metopic decoration achieved by the alternation of groups of vertical and horizontal lines occurs among the beaker ceramic of the Netherlands. It is seen on a fragment of the upper part of a particularly fine urn from Uddelermeer¹ and on another urn from Speuld.² There is every reason therefore for regarding the Dairsie urn as intimately associated with the continental series. But if overseas contact between Fife and the Netherlands is a necessary inference from the Dairsie and the Pendreich urns other forces were at work in the beaker colonisation of the area between the Firths of Forth and Tay. The remarkable similarity between the C_A urns from Collessie and Cakemuir, together with the feathered edging on the C_B beaker from Collessie, shows influence from the opposite shores of the Forth. Without intermediate examples it is at the moment impossible to say whether this movement came across the water or by land round the head of the estuary. If by the latter route the triangles on the Stirling beaker would gain a meaning. But the Tillyochie urn finds an echo in Lanarkshire, and if that parallelism really betokens contact the route probably lay across the head of the Forth estuary.

The B sherd from Balmuick, near Comrie, is proof that the Tay valley was included in the penetration of southeastern Scotland by the makers of B ceramic. From another tumulus at Balmuick a handled beaker, No. 254, was recovered. Its profile, exclusive of the handle, is a poor imitation of a B beaker, while the broad horizontally incised lines which encircle the vessel from lip to base are an imitation of the characteristic spiral string-markings. Only one other example of a handled urn, No. 62, is known from Scotland. It was recovered from a pit beneath a cairn at Cairnhill, Monquhitter, Aberdeenshire. The distribution, typology, and significance of English handled beakers has been worked out;³ but the conclusions reached are difficult to reconcile with the two Scottish outliers.

The urn from Tippermallo, near Methven, bears a slight resemblance to the curiously ornamented C_A beaker from Lanarkmuir in that the potter has filled a series of metopes with designs pre-eminently suited to zonal decoration.

¹ Bursch., *loc. cit.*, Tafel III. 1.

² *Ibid.*, *loc. cit.*, Tafel II. 3.

³ Fox, *Arch. Camb.*, vol. v. (1925) p. 1.

The beakers in the area between the Firth of Tay and the mouth of the Dee are widely scattered, and, with the exception of two examples in the southwest of the area, Nos. 72 and 80, and four examples in the northeast of the area, Nos. 74, 221, 217, and 220 from Edzell, Kinneff, Dunnottar, and Pityot, all the known beakers belong to the C_A category. The six urns which exhibit the influence of a B tradition afford an interesting study. The beaker from Fletcherfield is a very beautiful urn which seems to have been made, not by a careless B potter, but rather by a C_A potter who was attempting to copy the graceful profile of a rival ceramic. In part she has succeeded, although the great height of the vessel is not in keeping with the recurved lip and gently swelling body. The ornament is not significant. No. 221 from Kinneff is a well-made urn which in both profile and ornament exhibits traces of B influence. But the rows of alternating dashes are reminiscent of the beaker from East Barns and they will recur on a C_A beaker, No. 76, from Fallows, Monikie, in Angus. The urn, No. 218, from Kinneff is more difficult to analyse. Traces of possible B influence are slight, and the bands of vertical strokes are in the best C_A tradition. A somewhat analogous arrangement can be seen on beakers from Priest-town, Edzell, and Banchory-Ternan, Nos. 74 and 219. The beaker from Resting Hill, Dunnottar, is unornamented, but the low-set bulge indicates a B technique in manufacture. The urn from Pityot is an excellent example of a thoroughly degenerated B beaker. Here in actual fact is what has already been expounded in theory; for there is no indication that this urn has been in any way contaminated by C_A tradition. Its degeneracy is innate. The lip has shortened and is no longer recurved. The swelling has risen with disastrous effects on the profile; for in raising the bulge the potter has neglected to contract the base and the consequent heaviness of the under part gives a clumsy appearance to the vessel. The horizontal lines of stab decoration are a poor travesty of the continuous string-markings seen on pure examples of the type. A brief survey of these beakers has shown that any tendency to deviate from a B tradition results, with one exception, not in degeneracy but in the prominence of characteristics which belong to the C_A beakers in the same area. This fact is important. It tends to the deduction that here a B force is reacting upon a pre-existent C_A tradition. Both are virile movements and neither can perfectly assimilate the other.

There are seven C_A beakers. The profile of No. 75, from Wellgrove, Loches, shows remarkably few symptoms of degeneration. The vertical strokes, though they have several parallels in the area between the Tay and the Dee, are notably scarce farther north, and wholly absent to the

south of that area. No. 77 from Linlathen is extraordinarily degenerate; a fact which is in keeping with its associated riveted knife-dagger. No. 76 is from Kingswells, Fallows, Monikie. The rows of alternate dashes have already been noted, but their importance gains enormously when taken into association with the feathered edging of the groups of horizontal lines. Both motifs belong to East Lothian. No. 72 is a squat urn from Kirkbuddo in Angus. This really anomalous beaker is interesting since it exhibits a heavy band of chevron decoration, a feature which is very frequent on Rhenish and Dutch beakers, and which also tends to characterise the beaker ceramic of the counties bordering the Moray Firth. No. 78 from Idvies shows certain non-beaker traits. The clay is very dark and coarse, the lip is steeply bevelled, and the wall is relatively thick. The sole ornament consists of short maggot impressions arranged in a haphazard manner all over the external surface. This urn has either been made by a neolithic potter under the influence of beaker traditions or else by beaker folk dominated in spite of themselves by the later Scottish food-vessel ceramic. Since the urn was associated with burnt human remains, amongst which were found traces of bronze, the latter hypothesis has the greater probability. No. 79 from Collieston Mill, Arbroath, lacks significance in both form and ornament. The same is true of No. 73 from Noranside, Fern, whose ornamental motifs could be paralleled on several other beakers from the modern counties of Angus and Kincardine. There are, however, certain significant features in the ornamental scheme of this urn. The feathered edging to the horizontal lines should be noted, as also the heavy band of chevrons whose analogies have already been discussed. No. 74 from Priest-town, Edzell, has already been mentioned in connection with the group of C_h urns.

From the geographical standpoint a study of the distribution in the areas covered by the modern counties of Angus and Kincardine leads to important deductions. The coastal margin has been studiously avoided if the provenance of urns in Kinneff and Catterline is excepted. Another negative feature is the neglect of navigable estuaries such as those of the North and South Esk. In short, the distribution here is disseminated, it is in keeping with a slow permeation of the country from north or south rather than with penetration from the sea, which tends to focus upon a few outstanding areas. Though the possibility of penetration from Aberdeenshire where, as will be seen later, the sea-borne invasion was dominant, is slight on account of the many ornamental parallelisms in the country south and east of the Tay, the contingency must be borne in mind. The group of beakers in north-east Kincardine are geographically part of the Aberdeenshire unit,

though there is no very convincing proof that in ornament their affinities lie north of the Dee. The remaining urns of the area are witness to a slow penetration from the south. The Collessie and Cakemuir beakers have already shown how successfully East Lothian influence had crossed the Forth. The prevalence of rows of alternate dashes and feathered edging on the Angus and Kincardine urns is proof that the same influence was still at work north of the Tay. A close parallelism can be traced between the beakers from Noranside, Fern, Hoprig, Cockburnspath, and Grueldykes, Duns. The horizontal lines with feathered edging followed by deep bands of chevrons and cross-hatching can be seen on all three examples. But there are certain negative qualities about the beakers lying between the Tay and the Dee which are equally instructive. For none can any significant continental parallel be quoted. They are essentially native products. Furthermore, the triangle motif is wholly absent. This is important. The triangle appears in East Lothian and Aberdeenshire and there are apparently no intermediate examples. It seems therefore that the motif in each area has either two independent sources of origin or else a single source lying outwith Scotland. Finally, the influence of the B tradition in Angus and Kincardine is a legacy from the B penetration of the Firths of Forth and Tay. It is certainly not due to a fresh influx of the makers of pure B ceramic.

The beaker finds in Aberdeenshire are so numerous that a detailed study of the individual urns would only lead to a confused idea of the situation. Accordingly the problem will be dealt with primarily from a geographical aspect, but associations indicated by outstanding ornamental motifs will be treated as exhaustively as possible. A cursory glance at the map will show that the penetration of Aberdeenshire has been effected from the sea and that the newcomers had thereafter pushed inland along the lines of the principal river valleys. Excellent witnesses to this movement are the Dee and the Don, and to a lesser extent the Ythan, the Ugie, and the Deveron. A commentary upon the valleyward spread is the marked lack of beaker finds from the moors of the intervening watersheds.

The number of beakers in Aberdeenshire is more than five times the recorded number in Angus and Kincardine. It seems therefore illogical to derive the numerically large beaker population in the one area from the manifestly sparse occupation of the other. But despite the discrepancy in numbers and the fact that Aberdeenshire was a focus point of beaker invasion on the east coast of Britain, some effort at internal colonisation over the northern boundary of Kincardine was inevitable. Rows of alternating dashes enjoy a widespread vogue in

Aberdeenshire, and as there is every reason to derive this motif from south of the Forth the assumption is that it reached Aberdeenshire *via* the intermediary examples in Angus and Kincardine. In Aberdeenshire this particular design occurs on Nos. 3, 9, 17, 19, 22, 27, 34, 48, and 57 from Broomend, Inverurie; Ardiffney, Cruden; Parkhill, Aberdeen; Ord, Auchendoir; Inveramsay, Chapel of Garioch; Mains of Leslie, Premnay; Parish of Glass, and Keir, Belhelvie. The distribution is interesting. Starting from No. 17 at Parkhill, near the mouth of the Don, No. 3 is found some miles up the valley at Broomend, Inverurie. From Inverurie the penetration struck the valley of the Ury and No. 22 is found at Inveramsay, Chapel of Garioch. At this juncture the route turned aside to follow the Gady, as is shown by the two examples Nos. 34 and 19 from Mains of Leslie, Premnay, and Ord, Auchendoir. In the same manner the examples from Belhelvie and Cruden, Nos. 57 and 9, are witness to a northward coastal penetration of the same motif starting as before from Parkhill.

The triangle motif is widespread in Aberdeenshire and an analysis of its distribution on the lines of the foregoing will be equally instructive. Triangular ornamentation in one form or another occurs on the following beakers: Nos. 5, 10, 11, 12, 20, 22, 24, 25, 36, 39, 53, 55, 57, 60, and 65. They are from Broomend, Inverurie; Ellon; Whitestone, Skene; Freefield; Inveramsay, Chapel of Garioch; Savoch, Longside; Persley Quarry, Old Machar; Glasterberry, Peterculter; Upper Mains of Muiresk, Turriff; Mains of Leslie, Premnay; Hillhead, Ellon; Keir, Belhelvie; Avondow, Milltimber; and Newlands, Oyne. Of these localities six lie within a small area enclosed in the spit of land between the mouths of the Dee and the Don. Of the remaining nine, seven lie on the natural route of expansion from this area, i.e. Ellon and Belhelvie to the north; Inveramsay, Premnay, and Oyne to the northwest. It has been noted that the triangle motif occurs in East Lothian, but not in the intervening counties of Angus and Kincardine. Its distribution in Aberdeenshire is in harmony with a sea-borne invasion and subsequent landward diffusion. It seems curious that southeast and northeast Scotland should show direct communication in this manner. But the inference is not based entirely upon beaker ornamentation. It is supported by a parallelism in burial rites which is otherwise unique. From Keir, Belhelvie, on the low-lying coastal plain to the north of Aberdeen a cist was found which contained the contracted skeleton of a young female, together with no fewer than three beaker urns. In 1862 a cist was found at North Sunderland.¹ It contained three elaborately ornamented beakers and a female skeleton between twelve and eighteen years of age.

¹ *Proceedings Berwickshire Naturalists' Club* (1857-62), p. 428.

Much has already been said of the alternation of cross-hatched and vertical lines. Its origin has been suggested in Lanarkshire, while the developed form with intervening plain zones may possibly be an importation from Holland. Assuming for the sake of argument that all examples are to be derived from Lanarkshire, then the distribution of the ornament has great interest. Mossplat and Tillyochie have already been mentioned. The example from Balbridie, Durriss, No. 215, provides the stepping-stone to the many instances in Aberdeenshire where the motif enjoys great popularity. In the north it occurs on Nos. 13, 18, 23, 30, 47, 51, 63, and 64. On Nos. 13, 18, 23, 47, and 64 the ornament appears in its original form. On Nos. 30, 51, and 63 it is divided by plain zones as in the urn from Balbridie, Durriss. The Aberdeenshire localities are the following: Whitestone, Skeue; Parkhill, Aberdeen; Clashfarquhar, Banchory; King Street Road, Aberdeen; Kinaldy, Dyce; Mains of Leslie, Premnay; Leggats Den, Chapel of Garioch; and Memsie. It requires no commentary that, with the exception of three, all these urns lie close to the northern boundary of Kincardine. The fact that the Clashfarquhar example was associated with a fully developed form of food-vessel gives a relative time scale for the northward penetration of the motif.

The statement has been made that Aberdeenshire was a focal point of beaker invasion. What evidence is there to support this assertion? A general comparative survey of the beaker ceramic of the Rhineland and Holland with those of Aberdeenshire at once establishes the fact that underlying both groups there is a common artistic sense. Artistic values are the same. For instance, similar parts of a vessel are ornamented not necessarily by the same motif but in the same manner. Thus, a metopic arrangement is applied to the neck; and hanging triangles or a fringe of chevrons is placed immediately above the base in order to accentuate the effect of height; while a fundamental tradition is that of leaving an open band between the zones of ornament in order to emphasise their character. As to parallelism between individual motifs two instances may be mentioned. On one fragment, No. 46 from Kinaldy, Dyce, there occurs the juxtaposition of a five-lined chevron with a group of vertical lines. This combination should be compared with a similar motif on an urn from Uddelermeer, Holland.¹ In dealing with the association of alternating cross-hatched and vertical lines, it was suggested that the insertion of plain zones in this scheme might constitute a radical difference which would mark off those urns ornamented in this way from examples with decoration exactly similar to that on the prototype from Mossplat. The former decoration

¹ Bursch, *loc. cit.*, Tafel III. 5.

has already been mentioned as frequent upon certain Dutch beakers; especially on examples from Houtdorper Veld, Stroe, and Uddelermeer.¹ It is just possible that the urns from King Street Road, Aberdeen; Mains of Leslie, Premnay; and Leggats Den, Chapel of Garioch, should be related to these continental parallels rather than to any prototype in southern Scotland. Their provenance, however, does not tally with such a supposition and further examples must be awaited.

These facts are not the result of a primary settlement of beaker folk in two different areas; they are the result of intimate and secondary contact between those areas. It may seem bold to invoke the beaker folk across 400 odd miles of open sea from the estuary of the Rhine to the mouths of the Dee and the Don, but it is a necessary inference. Finally, if additional proof were needed for an intrusive element in Aberdeenshire it is afforded by two beautiful examples of pure B ceramic. One has unfortunately no locality; the other is from Torphins in the valley of the Dee.

Beaker finds occur sporadically along the shores of the Moray Firth. From the point of view of typology and decoration they are part of the main Aberdeenshire movement and represent the final products of its radiative diffusion. Such analogies occur in No. 112 from Buckie, where the rows of dashes and heavily outlined chevrons are reminiscent of certain Aberdeenshire beakers, notably No. 12 from Whitestone, Skene. Rows of dashes are seen on No. 114 from Boharm, Achroisk, and a multiple-lined chevron occurs on No. 113 from Cares-town, Deskford. No. 122 from Lesmurdie exhibits the alternation of rows of chevrons with a group of vertical lines; a combination already noted with all its due significance on a fragment from Kinaldy, Dyce. No. 125 from Buckie has around the lower portion groups of three short vertical lines divided by long groups of four horizontal lines. The fundamental idea is analogous to that behind the metopes on the urn from Dairsie in Fife, and is surely related to the many continental examples with a similar scheme. The triangle motif is fairly frequent in this area. It occurs on Nos. 124 from Gardenstown, 126 from Auchmore, Portsoy, 128 from Nether Buckie, on the Lesmurdie urn No. 122, and on No. 238 from Nairn. Evidence of direct continental connection, however, is not lacking. On several Moray Firth beakers there occurs a band of chevrons set close together. This arrangement is especially prominent on No. 239 from Cawdor Castle and on No. 237, probably from near Elgin. Indeed, both the profile and disposition of design on the latter urn are paralleled in a remarkable manner by a beaker from Helfta in the Halle Museum.² Close set lines of chevron ornament

¹ Bursch, *loc. cit.*, Tafel III, 2, 6.

² Castillo, *loc. cit.*, pl. clxxviii, 3.

are typical of the decoration on beaker ceramic from the Central Rhineland. There is a beaker from Oostereng in Holland figured by Bursch¹ which, were its provenance not known, could easily be mistaken for a typical Morayshire example.

Beyond the Moray Firth the beaker ceramic no longer forms a homogeneous group. The sporadic finds are witness rather to a spirit of enterprising exploration than to systematic colonisation and settlement. No. 256 from Fyrish, Evanton, is decorated by a metopic design on the short upstanding neck. No. 257 from Edderton has bands of close set chevrons. No. 272 from Dunrobin has no outstanding decoration, while No. 271 from Cambusmore might have resulted from the careless manufacture of a typical Rhenish form. No. 259 from Tarradale in the Black Isle is the only example of outstanding interest. This beaker has an almost perfect B profile. Yet the swelling has been placed too high relative to the total height to permit of it being placed alongside pure examples of the type. In outline it should be compared with some Dutch beakers figured by Bursch.² The ornament on the Tarradale urn includes alternating cross-hatched and vertical strokes. Sometimes these lie in juxtaposition, sometimes they are divided by a plain zone. This is the only example so far in Scotland where both forms of this ornament occur on the same vessel. The fragments of pure B ware from Garrywhin and Yarrows are stray finds. The Shetland pieces are too small for profitable discussion, as are also those found in the chambered cairn at Lower Donureay.

From the foregoing analysis of the Scottish beaker ceramic it is possible to put forward the following suggestions. These cannot be given the status of conclusions, for, though much additional material has accumulated within the last few years, it is impossible to guess how much more may await discovery and whether what remains to be found will support or invalidate existing hypotheses.

On the southeastern borders of Scotland the beaker ceramic is located in two very definite groups. The most southerly, extending from Edgerston to Kelso, has been deposited by a migratory movement across the Cheviots which penetrated down the valleys of the Jed Water, the Teviot, the Kyle, and the Till. The more northern group along the banks of the Blackadder and Whiteadder indicates exploration by the Tweed and its northern tributaries. There are ornamental motifs in common between these two groups, but geographical reasons discourage any immediate contact. The similarity seems due to a common source in northeastern England.

North of Berwickshire it becomes necessary to invoke continental

¹ Bursch, *loc. cit.*, Tafel II. 8.

² *Ibid.*, *loc. cit.*, Tafel I. 14.

analogies in explanation of several ornamental motifs which appear on the beaker ceramic of that area. The influence which colonised Berwickshire is quickly dissipated, and sea-borne invasion from Holland must be inferred. The pure B ware from East Lothian raises problems which cannot for the moment be resolved.

In southwestern Scotland an entirely different set of forces is at work. Here maritime movements from Wales are in progress coupled with possible penetration from the Firth of Forth via the headwaters of the Tweed, the upper reaches of the Clyde, and the valley of the Nith. Though geographical barriers to the latter route are formidable the beaker ceramic and the neolithic B fragment at Drummelzier must admit of some explanation of which a northern derivation seems the most reasonable.

The remaining beakers of the Scottish west coast are all part of the sea-borne exploratory movement from south of the Solway. Muirkirk is an important domestic station where the pseudo-beaker pottery was no doubt the product of an enslaved native attempting to copy the ceramic of a beaker master. The concentration around Poltalloch may be a commentary upon the surface copper lodes which were evidently exhausted during prehistoric times. The group of beakers from Skye support the Welsh parallels already quoted.

Communication between east and west, if it took place, was along the line of the Forth and Clyde. The alternate dashes on the C_B beaker from Poltalloch bear comparison with those on the urn from East Barns; while the Mossplat and Tillyochie urns testify to communication across the head of the Forth estuary.

The beakers between the Forth and the Tay have been influenced by the B penetration of East Lothian. Consequently C_B beakers predominate. Some exhibit inherent degeneration processes, others diverge from the pure type through endeavouring to assimilate C_A characteristics. Important evidence for direct communication across the North Sea is afforded by the ornament on the Pendreich urn from Bridge of Allan and by that on the beaker from Dairsie. Influence from south of the Forth is seen in the striking parallelism between the Collessie and Cakemuir beakers, while the settlement site at Tents Muir should be compared with those at Gullane and North Berwick.

The beakers from Angus and Kincardine are related on the one hand to examples farther south, and on the other hand to the group in Aberdeenshire. Certain genuinely native decoration, however, can be traced to the former area, while the absence of triangular motifs is a warning against a too facile use in explanation of the internal spread of a motif. There is no evidence that communication was established

between this area and the Continent; a fact which may have been due to the dangerous character of the rocky coast-line.

Aberdeenshire has undoubtedly been colonised from Holland and the Rhineland. Here is a focal point of the east coast invasion, while subsequent inland penetration has manifestly been by way of the principal river valleys. Some penetration from Kincardine must have taken place, and no doubt coastwise exploration from northeastern England was prosecuted. The similarity in burial rites between North Sunderland and Belhelvie point to contact which was probably indirect.

Along the Moray Firth the Aberdeenshire movement radiates and loses vigour. Yet the close-set chevron ornament which is such a feature of this area may have been introduced by seamen from Holland.

Farther north still, the beaker finds are sporadic and contribute nothing to a general estimate of the character of the invasion.

The foregoing analysis of the Early Bronze Age Beaker Pottery from Scotland has led to certain deductions. It must now be recognised that the distribution on the east and on the west raises problems which are neither identical nor related. Abercromby had been tempted to adopt a similar line of reasoning, but the material at his disposal twenty years ago was too limited to justify any such conclusion. To-day there can be no ambiguity. Contact between east and west must be reduced to a minimum, and the problems of each coast reduced to separate solutions.

The beaker ceramic on the west owes its provenance to maritime enterprise. The small number of the examples and their sporadic distribution over a relatively wide area are additional proof of the character of this movement. On the west the beaker folk were explorers. They did not come to colonise or settle, they came in a spirit of curiosity which, though it meant no cultural supremacy, is a notable commentary upon a type of migratory spread which is almost unique in prehistory. On the west the beaker folk had no individuality. They are quickly assimilated by the chambered cairn culture which, though by this time stagnant, was by no means defunct. The very fact that their ceramic is found in the older sepulchres is proof that their impression was evanescent. The immediate origin of the west coast beakers must be sought in Wales, but possibly the ultimate source will be found in Brittany or even Portugal itself.

On the east coast there is no evidence of contact with a pre-existing neolithic population, and beaker cultural supremacy is firmly established. Here there has been penetration by land from the north of England and invasion from the sea. Part of this latter movement has come

directly from the Continent, part of it has come coastwise from south-eastern Britain. But the analysis of distribution on the east is complicated by the possibilities of internal spread. These movements ought rightly to be shown by similarities in ornament and technique, but such criteria are dangerous when universally applied and can only become reliable as material increases. All possible internal contacts, however, have been mentioned in the hope that future finds may corroborate one or other of the theories put forward.

It remains to acknowledge my indebtedness for assistance in the compilation of this paper: especially to Professor Gordon Childe who suggested the subject of research and who throughout has been an unfailing source of inspiration and encouragement; and to Dr Graham Callander for much information and most valuable guidance in respect to individual beakers at the Museum of Antiquities, where I received every facility for study.

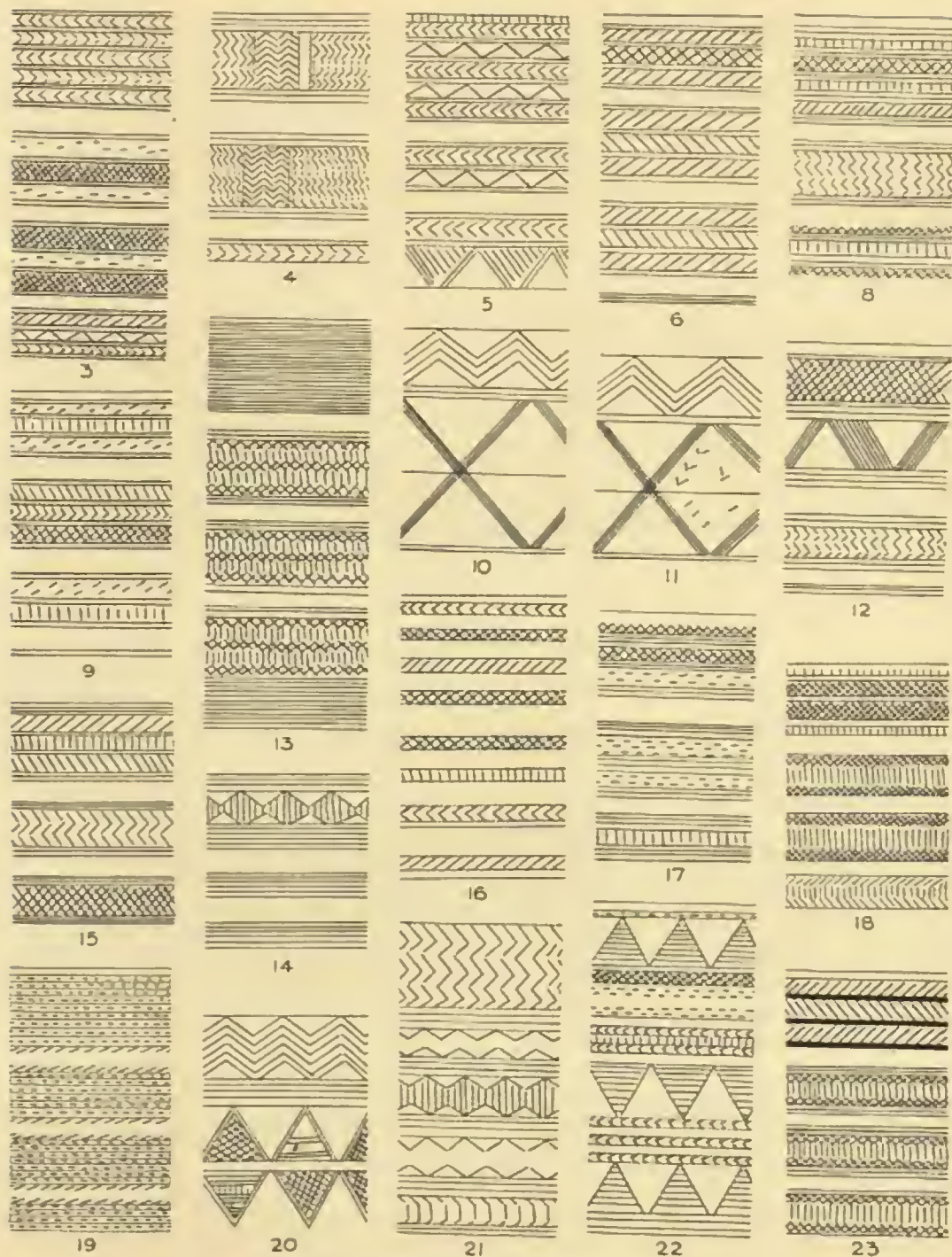


Fig. 1. Ornamentation on Scottish Beakers.

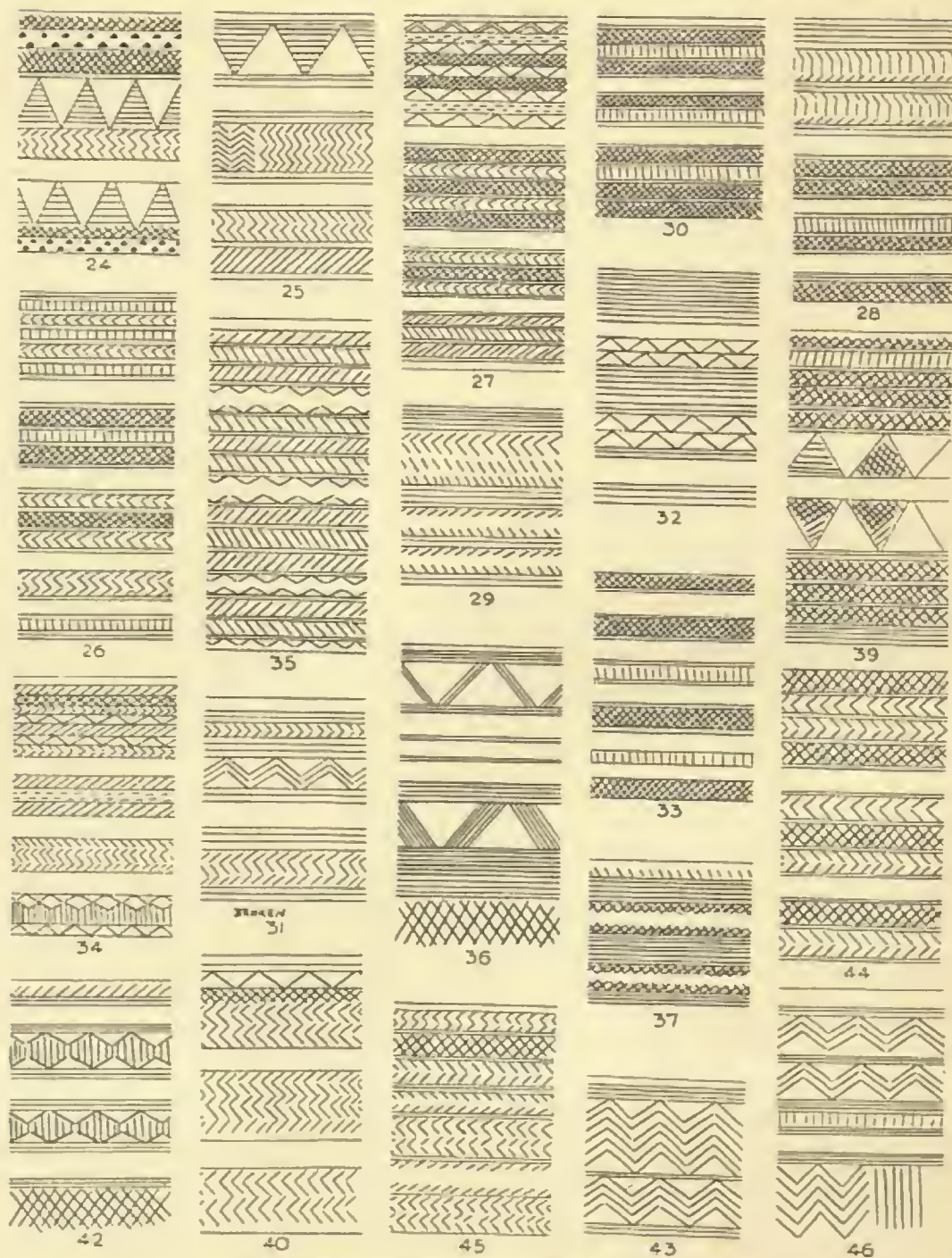


Fig. 2. Ornamentation on Scottish Beakers.

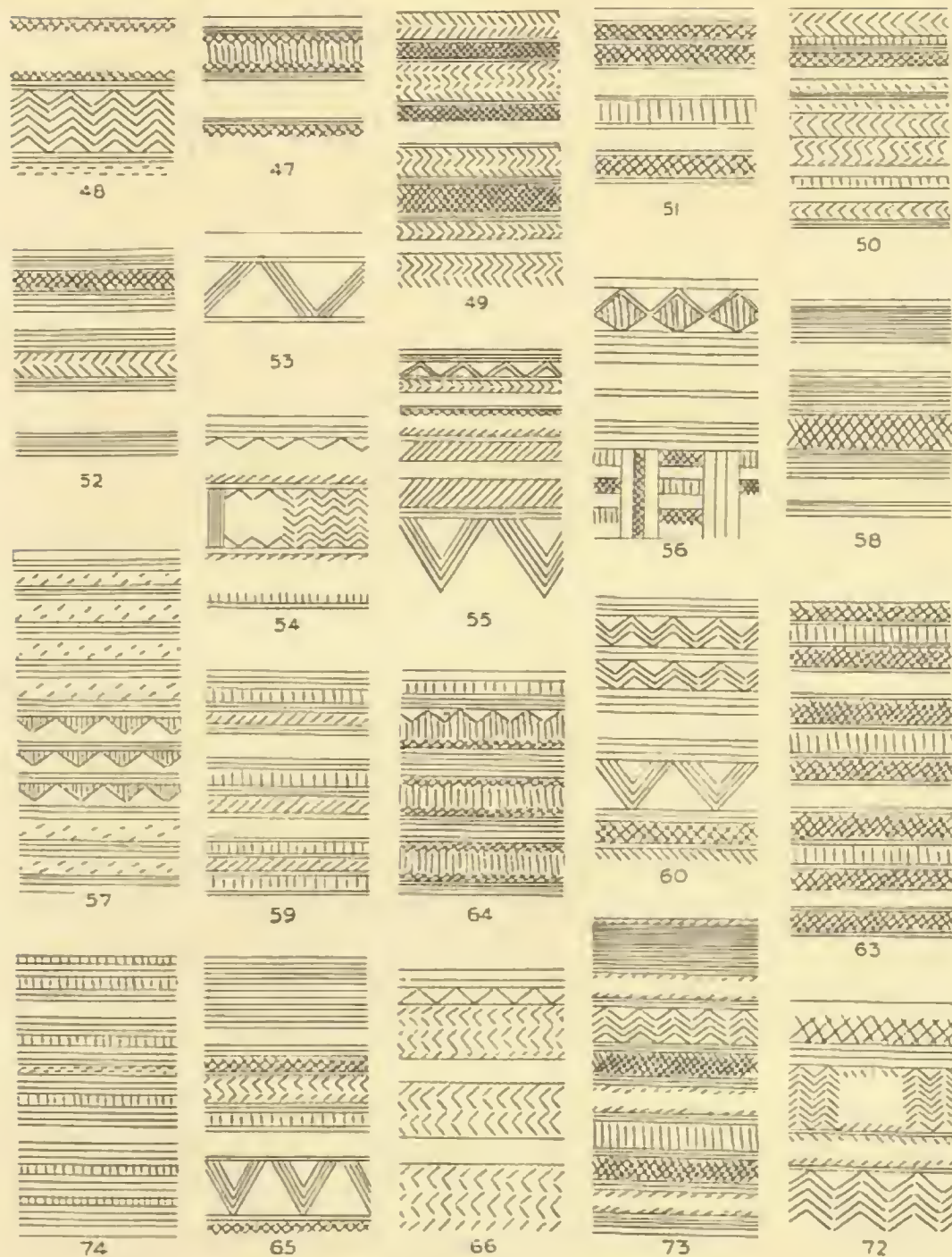


Fig. 3. Ornamentation on Scottish Beakers.

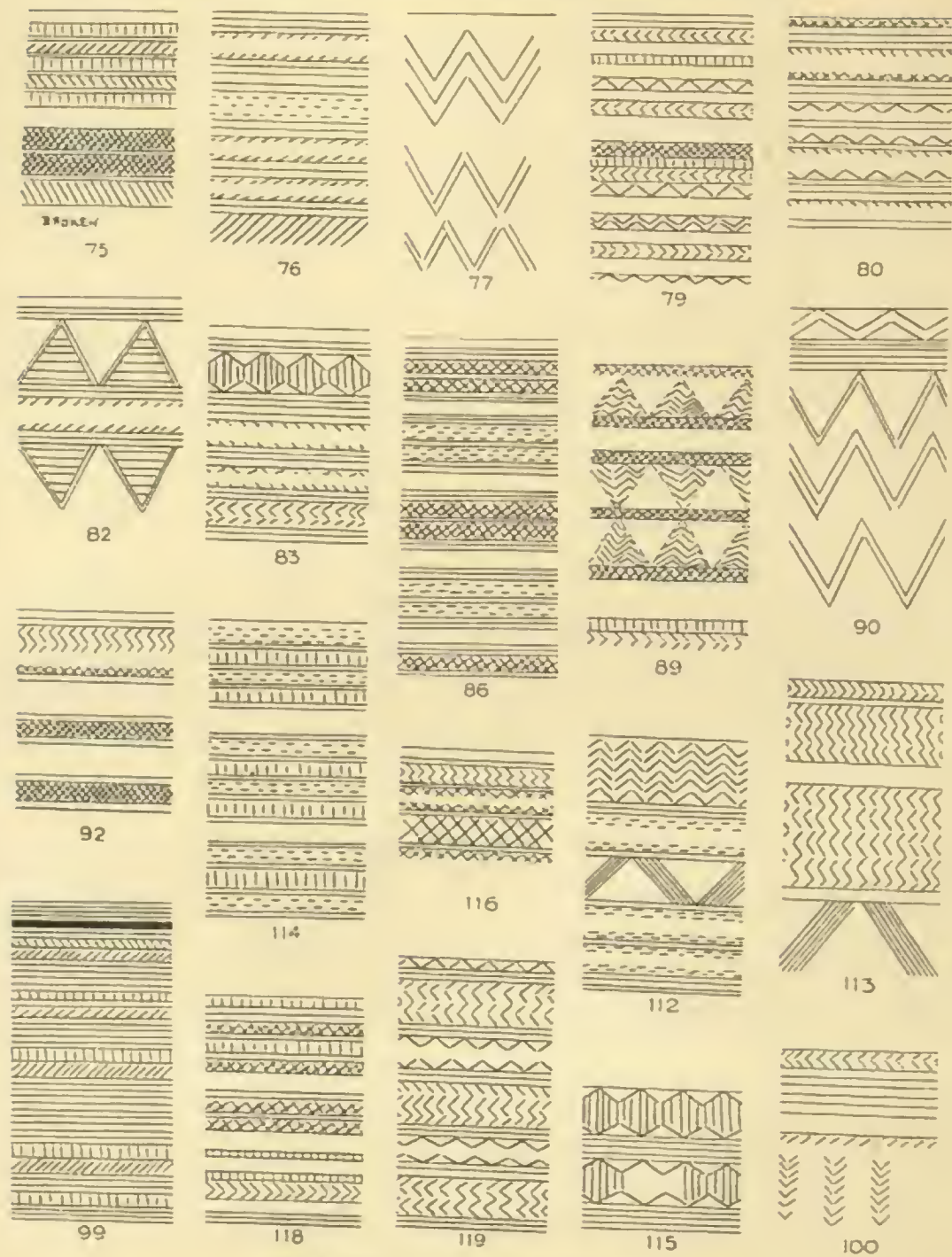


Fig. 4. Ornamentation on Scottish Beakers.

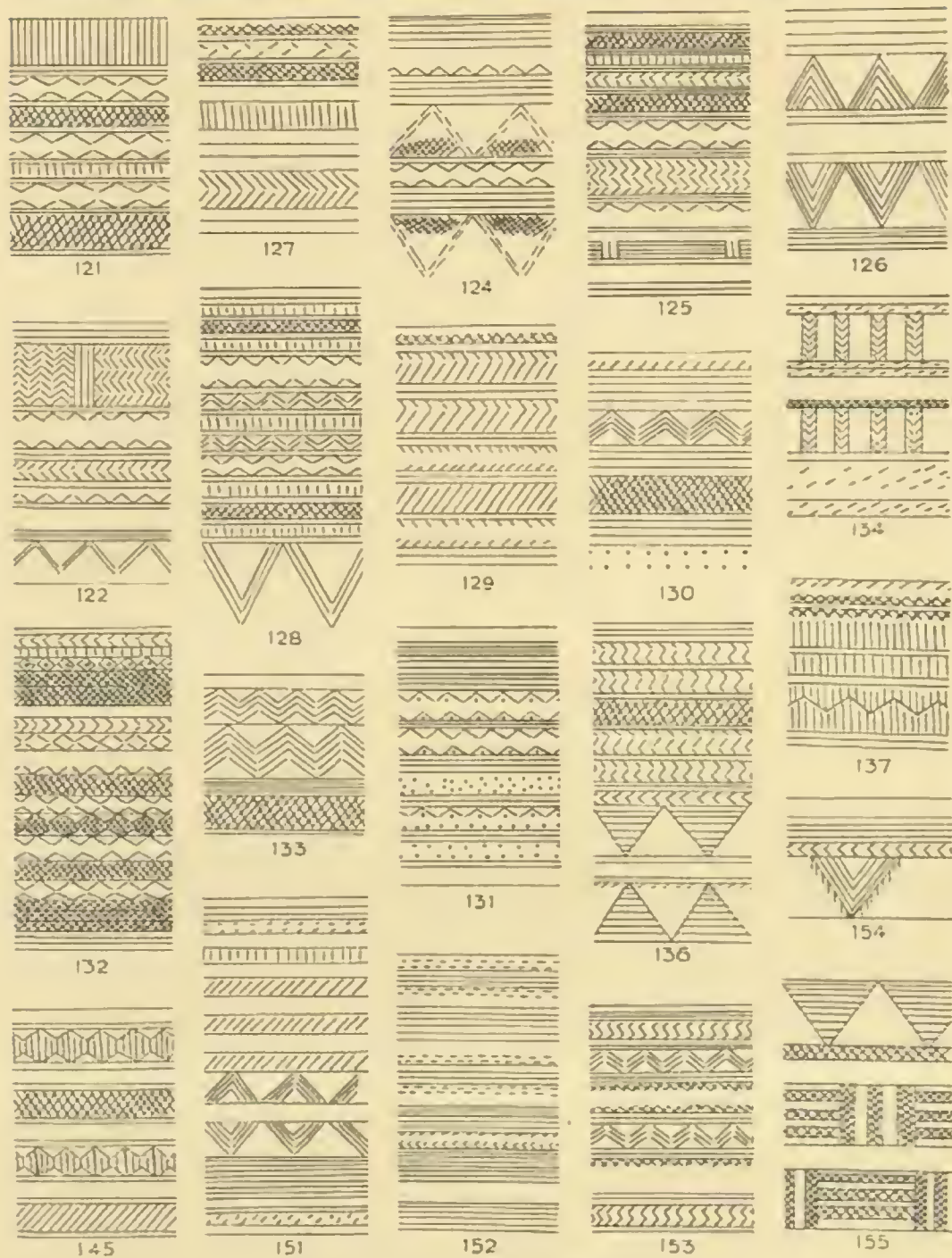


Fig. 5. Ornamentation on Scottish Beakers.

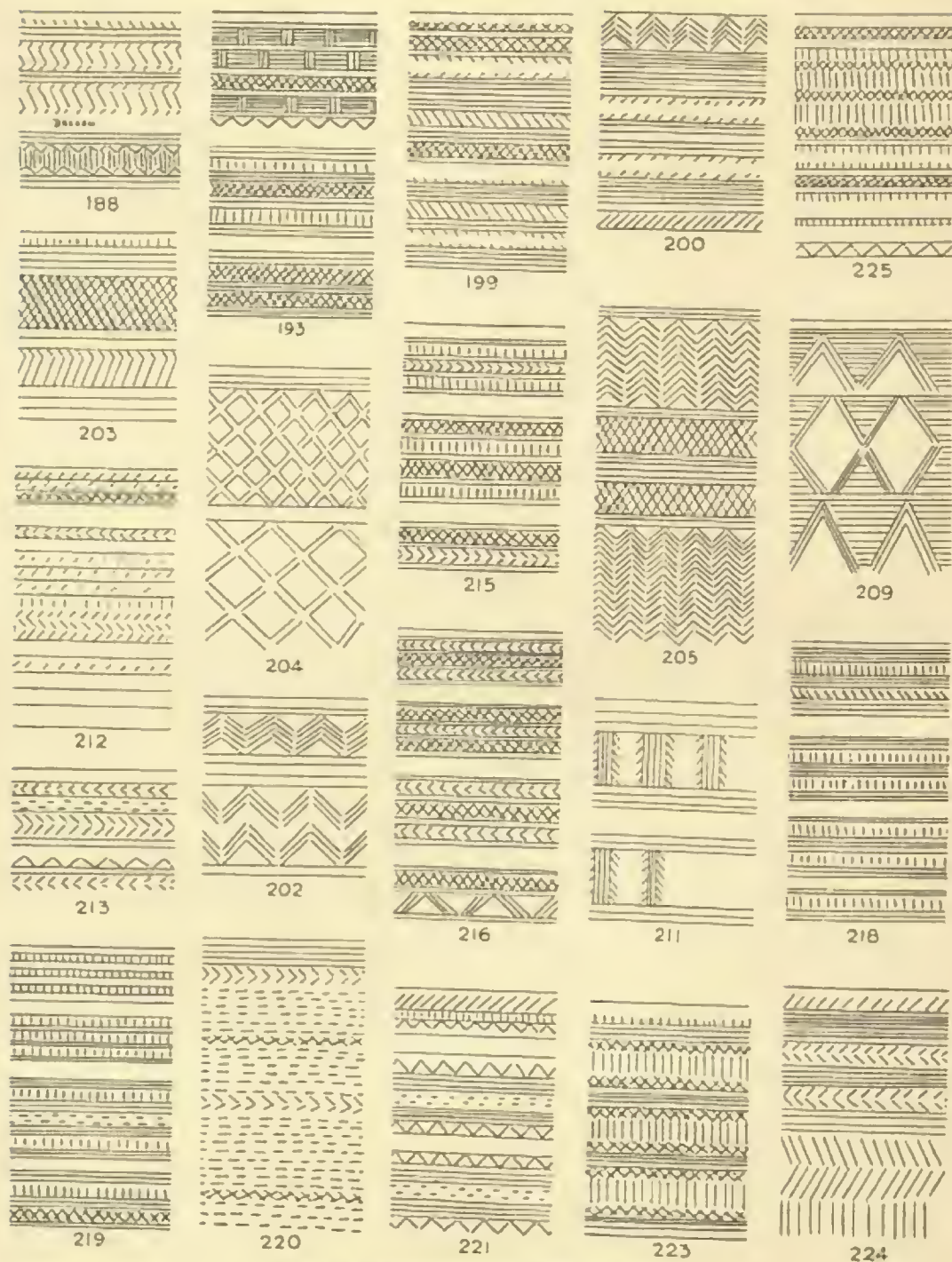


Fig. 6. Ornamentation on Scottish Beakers.

EARLY BRONZE AGE BEAKER POTTERY OF SCOTLAND. 169

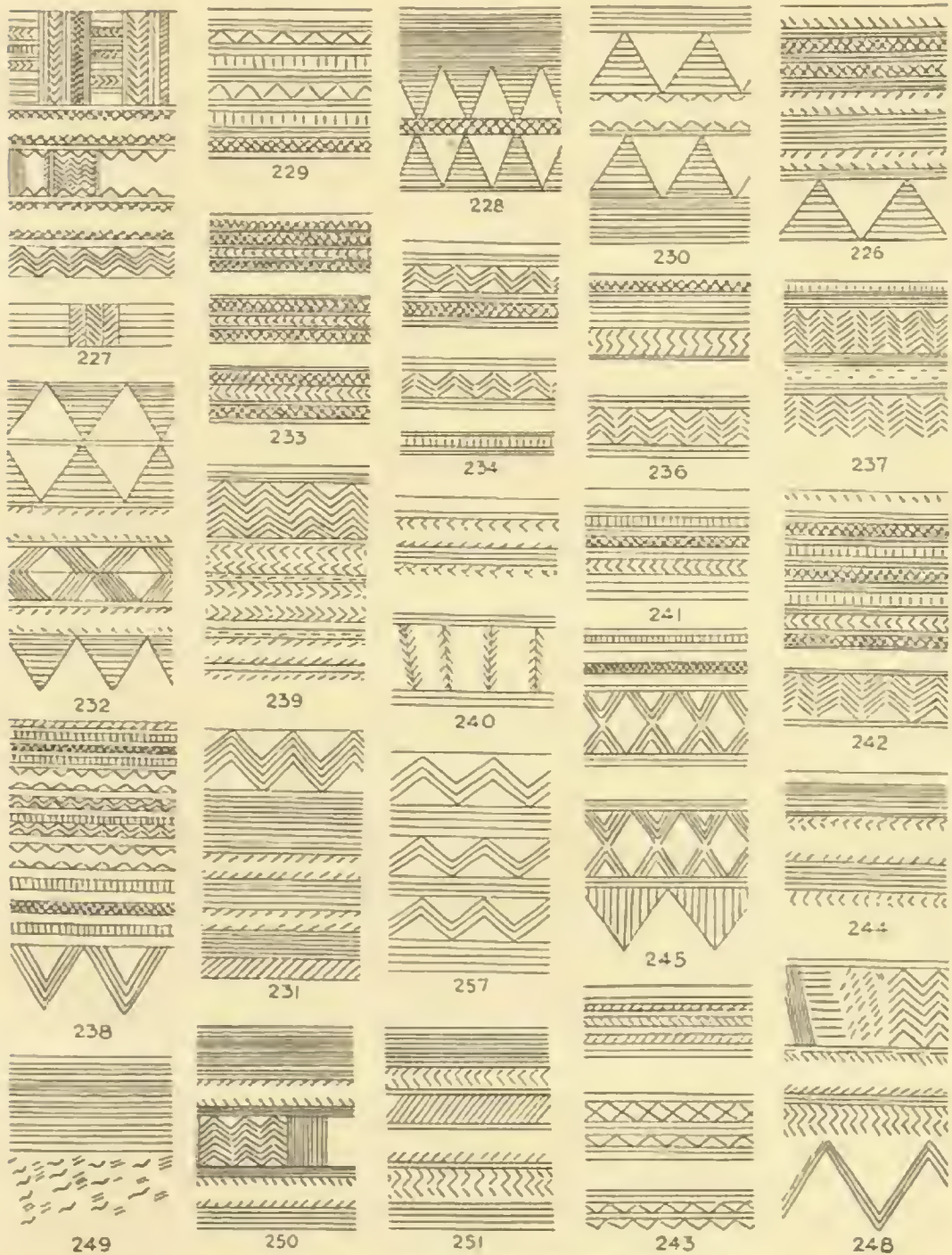
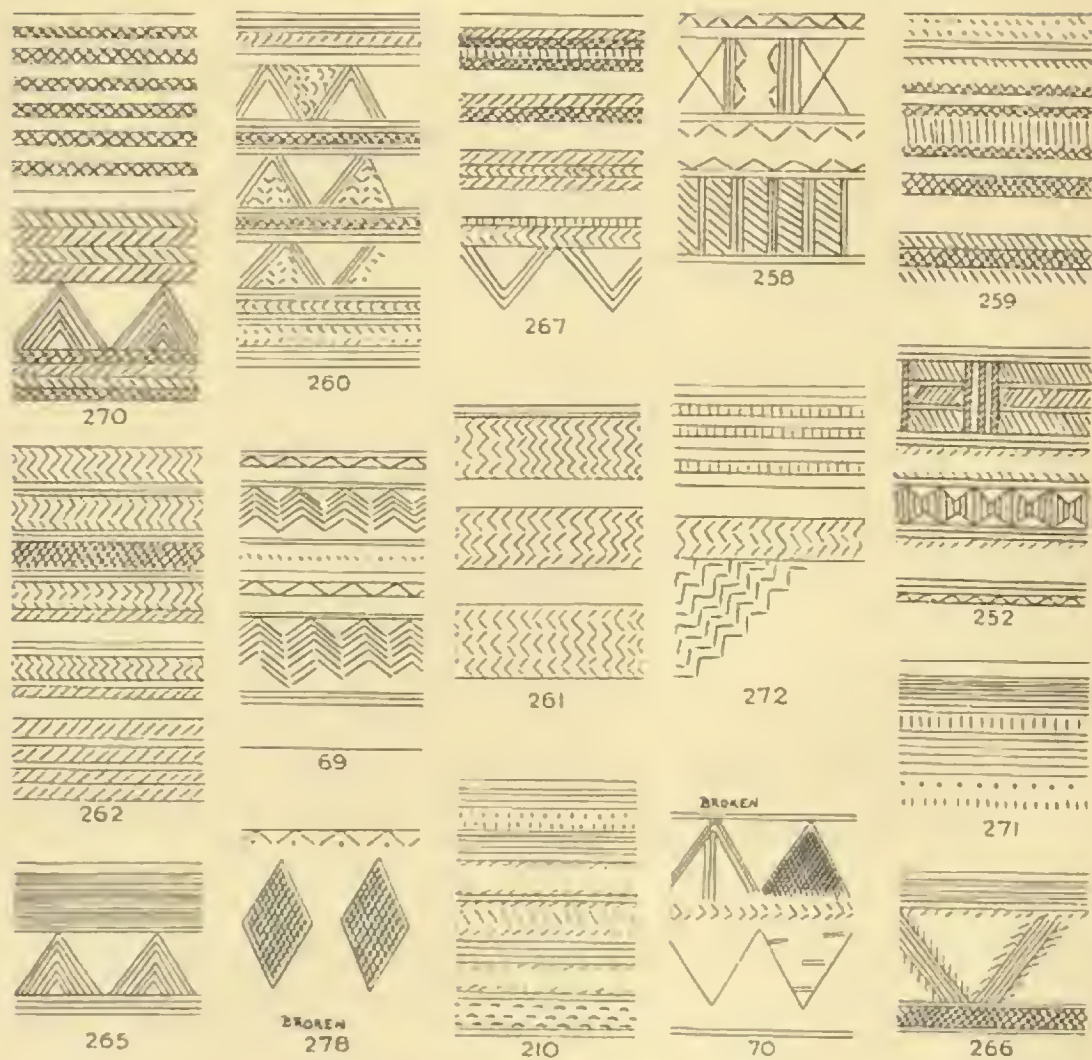


Fig. 7. Ornamentation on Scottish Beakers.



CORRIGENDA.

Ornamentation Figures.

- No. 21. Last row of oblique strokes should run from left to right downwards.
 No. 28. Second and fourth rows of oblique strokes in the two upper ornamental bands should run from left to right downwards.
 No. 82. Outline of triangles not continuous but formed by a series of dashes.
 No. 90. First row of triangles below group of horizontal lines should be horizontally shaded.
 Nos. 130, 131 to be interchanged.
 No. 212. Ought to have row of short vertical strokes at lowest edge.
 Nos. 231, 232 to be interchanged.
 No. 252. Ought to be No. 250.

Distribution Map.

- No. 31. Bankhead, Pittligo, to be No. 37.
 No. 210. Should be a black dot.
 No. 216. Ditto.
 No. 269. Should be an open circle.

NOTES TO THE TABLE.

1. Ornamented from lip to base with a continuous spiral made by the pressure of a twisted cord.
2. Ornamented from lip to base with a continuous spiral made by the pressure of a twisted cord.
3. The account given by Reid differs slightly from that given by Low and P.S.A.S. In particular, Reid omits reference to the beaker.
4. Reid gives the cephalic index as 85.0. In Reid and Morant's paper, *Biom.*, xx, B, 3 and 4, December 1928, the index is given as 85.6. The more recent statement has been preferred.
5. Formerly in Freefield House.
6. In the National Museum *Catalogue* E.G. 28 and E.G. 29 are registered as two urns from Kinaldy, Dyce, presented by Alexander Watt. The *Catalogue* also registers E.T. 35 as a skull from Kinaldy, Kintore, presented by A. Watt in 1856. The fragment E.G. 28 has a note attached: "Found in a cist near Kinaldy with skull." The account in *C.B.* mentions four cists at Kinaldy, each of which contained human remains and "a vase." The skull E.T. 35, furthermore, is registered here as that of a male at least 40 years of age.
7. The incised ornament has a white filling.
8. Ornamented from lip to base with a continuous spiral made by the pressure of a twisted cord.
9. One fragment of this clay lutng retains the impression of a thumb.
10. The account given by Canon Greenwell differs somewhat from that given by Mr Craw. The more recent statement has been preferred.
11. The cairn was enclosed at one corner of a roughly rectangular tumulus within whose margin were rows of wooden stakes. There is doubt whether cairn and tumulus are contemporary. The evidence argues for a disturbance of the cairn during the formation of the tumulus.
12. It has been suggested that the large area to be roofed over would require a central roof-tree. This may explain the central pit, the oak, the packing stones, and the "ceremonial" beaker.

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13. The skull is preserved in the Edinburgh University Museum of Anatomy and is labelled B 237. The account in *Arch.* contains an extract from the report on the skeleton by Professor Cunningham, who gives the cephalic index as 84.5. The former figure is from Reid and Morant's paper in *Biom.*, xx. B, 3 and 4, December 1928.

14. This may prove to be another domestic station of the type of Glenluce.

15. In *B.N.C.*, xxiv., Mr Craw evidently regarded these two beaker fragments as part of the same urn. It is suggested that they represent two urns. There is, however, no evidence for a second short cist near Duns railway station, and the question must therefore remain open. E.G. 56, which was presented in 1923, is only thought to belong to the Grueldykes burial. This uncertainty may contain the solution of the problem.

16. The food-vessel represented a secondary and intrusive burial disturbing a primary beaker interment.

17. The beaker fragments and the jet toggle, at the least, represent a secondary intrusive burial.

18. See *A.J.*, April 1932—Graham Clarke.

19. Under 286 *via* Abercromby figures a complete urn, E.G. 43, and the lip and wall of another beaker. No mention is made in the text of this second urn, and from all accounts only one was found in the Acherole cist. The *P.S.A.S.* account gives the cephalic index as 85.8. The other value is taken from Reid and Morant's paper in *Biom.*, xx. B, 3 and 4, December 1928.

20. In the paper by Reid and Morant, *Biom.*, xx. B, 3 and 4, December 1928, the skeleton found at Windy Mains in 1857 is registered as that of a female. But there is no evidence as to the cist from which this skeleton came.

21. Which should be compared to similar finds from the Oban and Oransay shell-mounds.

22. The original burial had been very much disturbed, as pieces of burnt bone, fragments of four cinerary urns, and five mediæval vessels were recovered.

23. Two sherds.

24. The cup- and ring-markings should be compared with similar ornamentation on the cover-stone of the Carnwath cist No. 229.

25. Part of the ornamentation has a white filling.

26. The accounts given in *A.A.J.*, vols. x, and xvii., differ very materially from that given by Anderson. The latter account has been preferred.

27. Which should be compared with the example from Stobo, *Anderson*, i. 58.

28. The ring-markings have analogies with those on the cover-stone of the Coilsfield cist, which contained a food-vessel of Type B.

29. The cephalic index is taken from *Biom.*, xx. B, 3 and 4, December 1928. *P.S.A.S.* gives it as 82.0. The more recent statement has been preferred.

30. Abercromby figures two urns from Tipperinallu, Methven, Nos. 192, 194. It is suggested that they are one and the same urn. No. 194 is only known from a rude sketch exhibited before the Society of Antiquaries of Scotland. It may well have been a rough sketch of No. 192, which is housed at Stirling. Abercromby reproduces the sketch as that of a second urn from Tipperinallu. If they are indeed distinct examples the parallelism in ornamental motif is remarkable.

31. Several food-vessels are recorded as having been found at Friars, Kelso. Whether they were in any way connected with the beaker is not known.

32. In *J.R.A.I.* the cephalic index is given as 82.4. The present figure is taken from *Biom.*, xx. B, 3 and 4, December 1928, and has been preferred as the most recent statement.

ABBREVIATIONS.

A = Abercromby, *Bronze Age Pottery of Great Britain and Ireland*, vol. i., Oxford, 1912.

A.A.J. = *Archæological Association Journal*.

A.J. = *Antiquaries Journal*.

Anderson = Anderson, *Scotland in Pagan Times*, vol. i., Edinburgh, 1886.

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- Arch. = *Archæologia*.
 Arch. Hist. Coll. = *Archæological and Historical Collections*.
 Biom. = *Biometrika*.
 B.F.C. = *Trans. Banffshire Field Club*.
 B.M. = British Museum.
 B.N.C. = *Proceedings of the Berwickshire Naturalists' Club*.
 Cat. Ant. Edin. = *Catalogue of Antiquities* . . . exhibited in the Museum of the Archaeological Institute of Great Britain and Ireland during their annual meeting held in Edinburgh, July 1856.
 Cat. M. Coll. = Reid, *Illustrated Catalogue of Specimens from Prehistoric Interments found in the North-east of Scotland*. Anthropological Museum, Marischal College, Aberdeen, 1924.
 C.B. = Davies and Thurnam, *Crania Britannica*, London, 1865.
 Coll. Soc. Ant. Lond. = Collection of the Society of Antiquaries of London.
 Continuer = Cordiner, *Remarkable Ruins and Romantic Prospects of North Britain*, London, 1705.
 (No pagination.)
 F. = Fragmentary.
 (H) = Handled urn.
 Illus. L.N. = *Graphic, and Illustrated London News*.
 I.S.S.F.C. = *Proc. Inverness Scientific Society and Field Club*.
 J.R.A.I. = *Journal of the Royal Anthropological Institute*.
 N.M.A. = National Museum of Antiquities of Scotland.
 N.U. = Erskine Beveridge, *North West, its Archaeology and Topography*, Edinburgh, 1911.
 P.A.A.S.A.U. = *Proceedings of the Anatomical and Anthropological Society of Aberdeen University*.
 Proc. D.G.A.S. = *Proceedings of the Dumfriesshire and Galloway Natural History and Antiquarian Society*.
 Proc. R.S.E. = *Proceedings of the Royal Society of Edinburgh*.
 P.S.A.L. = *Proceedings of the Society of Antiquaries of London*.
 P.S.A.S. = *Proceedings of the Society of Antiquaries of Scotland*.
 T.G.A.S. = *Transactions of the Glasgow Archaeological Society*.
 T.P.P.S. = *Transactions and Proceedings of the Perthshire Society of Natural Science*.
 T.S.A.S. = *Transactions of the Stirling Natural History and Archaeological Society*.
 Wilson = Daniel Wilson, *Prehistoric Annals of Scotland*, London and Cambridge, 1863.
 ∞ = Unknown quantity.

LIST OF EARLY BRONZE AGE BEAKERS FOUND IN SCOTLAND,
*Aberdeenshire.**

No.	Type.	Locality.	Preserved.	References.	Remarks.
1	B ¹	Not known.	N.M.A., E.G. 39.	<i>P.S.A.S.</i> , xl. 313; <i>A.</i> 225.	Within ring of stones at centre of cairn.
2	B ²	Sindrayawalla Hill, Torphichen.	Learney House.	<i>P.S.A.S.</i> , xl. 312; <i>A.</i> 225a.	
3	C _a	Broomend.	N.M.A., E.G. 23.	<i>P.S.A.S.</i> , vii. 110; xvii. 455; xl. 27;	Cist with two male skeletons covered by matted substance; willow, oak, charcoal, three flint flakes and object of clay or bone. Shuts cemented with clay, and floor strewn
4	C _b	Inverurie.	24.	liv. 155; <i>A.</i> 226, 227.	with pebbles. One cephalic index 78.9.
5	C _b	Do.	Inverurie.	<i>P.S.A.S.</i> , vii. 115; xvii. 455; xl. 27;	Cist, E.-W., with skeletons of adult female and infant covered with fibrous substance; two flint flakes, charcoal
6	C _a	Do.	Do.	liv. 155; <i>A.</i> 249.	and object of twisted oxhorn. Floor strewn with pebbles.
7	F.	Do.	Do.	<i>P.S.A.S.</i> , vii. 115; liv. 155.	Cist with skeleton of young person.
8	C _a	Ardfiacny ?	Peterhead.	<i>Hyd.</i> , xxii. 306;	Beneath tumulus in cist with skeletons of adult male, boy
9	C _a	(Artillery), Cruden.	Do.	<i>Wilson</i> , i. 75; <i>Cat. Ant. Edin.</i> , 11; <i>A.</i> 228, 229.	aged 12, and dog; also necklaces of jet and amber, flint axe, bracelet, seven barbed and stemmed arrow-heads, knife and flake of flint.
10	C _b	Ellon.	N.M.A., E.G. 36.	<i>P.S.A.S.</i> , xxvi. 202;	With four flint arrow-heads.
11	C _a	Do.	37.	<i>A.</i> 220, 231.	
12	C _b	Whitestone, Skene.	Aberdeen.	<i>P.S.A.S.</i> , xl. 28; <i>P.A.A.S.A.U.</i> , 1904-6, 128; <i>Cat.</i> <i>M. Coll.</i> , No. 3;	Cist, E.-W., with three flint scrapers, charcoal and skeleton of adult male. Cephalic index 80.2.
13	C _a	Do.	Do.	<i>A.</i> 232, 233.	
14	C _a	Pittodrie, Oyne.	Hunterston.	<i>P.S.A.S.</i> , xl. 23;	Cist, E.-W.
15	C _b	Do.	Do.	<i>A.</i> 233a, 233b.	
16	C _a	Cruden.	N.M.A., E.G. 20.	<i>P.S.A.S.</i> , xi. 408; <i>A.</i> 237.	Cist.
17	C _a	Parkhill.	Aberdeen.	<i>P.A.A.S.A.U.</i> , 1902-4, 9; <i>Cat.</i> <i>M. Coll.</i> , No. 4;	Cist with skeleton of male aged 60 covered by matted substance. Cephalic index 85.0.
18	C _a	Do.	N.M.A., E.G. 2.	<i>A.</i> 238. <i>P.S.A.S.</i> , xvi. 70; <i>P.A.A.S.A.U.</i> , 1902-4, 11; <i>Cat.</i> <i>M. Coll.</i> , No. 14; <i>A.</i> 253.	Cist with charcoal, bones of young bear and skeleton of male aged 25-30. Cephalic index 87.0.

19	C _A	Ordl. Auchtermuchty.	Aberdeen.	<i>P.A.A.S.A.U.</i> , 1902-4, 17; <i>Cat. M. Coll.</i> , No. 7; ⁴ <i>P.S.A.S.</i> , xv, 103; <i>A.</i> , 241.	Cist with skeleton of male aged 50. Cephalic index 85.0.
20	C _A	Freedfield.	Unknown. ⁴	<i>P.S.A.S.</i> , xv, 103; <i>A.</i> , 241.	Near pedestal of stone embedded in conical clay mound covering small cairn.
21	C _A	Clinterty, Kinellar.	Aberdeen.	<i>J.R.A.I.</i> , 1902, 383; <i>P.A.A.S.A.U.</i> , 1902-4, 15; <i>Cat. M. Coll.</i> , No. 10; <i>A.</i> , 243.	Cist with skeleton of male aged 60. Cephalic index 84.3; axe-head of men silex, knife, five scrapers and two barbed and stemmed arrow-heads of flint, crystal of topaz, and ring and needle of bone (?).
22	C _A	Inverunaway, Chapel of Garioch.	N.M.A., E.G. 16.	<i>P.S.A.S.</i> , iv, 165; <i>A.</i> , 244.	With skeleton of male aged 30.
23	C _A	Chasfordrighar, Banchory.	Free Church College, Aberdeen.	<i>Wilson</i> , l. 419; <i>P.S.A.S.</i> , xxii, 303; <i>A.</i> , 245.	Cist with food-vessel and skeleton of adult.
24	C _B	Savoch, Longside.	Peterhead.	<i>P.S.A.S.</i> , xxii, 306; <i>Cat. Ant. Edin.</i> , 11; <i>A.</i> , 246.	In tumulus.
25	C _B	Forley Quarry, Old Machar.	Aberdeen.	<i>P.A.A.S.A.U.</i> , 1902-4, 13; <i>Cat. M. Coll.</i> , No. 12; <i>A.</i> , 247.	Cist with skeleton of male aged 60. Cephalic index 86.5; arrow-head and knife of flint.
26	C _A	Parish of Leslie.	Unknown.	<i>Reliquary</i> , iii, 40; <i>A.</i> , 248.	Cist with male skeleton and at least three flint arrow-heads.
27	C _B	Not known.	B.M.	<i>A.</i> , 251.	
28	C _A	Do.	N.M.A., E.G. 21.	<i>A.</i> , 258.	
29	C _B	Do.	B.M.	<i>A.</i> , 263.	
30	C _A	King Street Road, Aberdeen.	N.M.A., E.G. 35.	<i>P.S.A.S.</i> , xxiv, 440.	
31	C _A	Near Aberdeen.	Unknown.	<i>A.</i> , 261.	
32	C _B	Stoneywood.	Aberdeen.	<i>P.A.A.S.A.U.</i> , 1902-4, 12; <i>Cat. M. Coll.</i> , No. 9; <i>A.</i> , 254.	Cist with skeleton of male aged 40. Cephalic index 92.3. Shula cemented with clay.
33	C _B	Cairn, Huntly.	Elgin.	<i>P.S.A.S.</i> , xxii, 342; <i>A.</i> , 255.	
34	C _A	Maina of Leslie, Prunney.	Aberdeen.	<i>P.S.A.S.</i> , xli, 116; <i>P.A.A.S.A.U.</i> , 1906-8, 54; <i>A.</i> , 256.	Cist, E.-W., with quartz pebbles and skeleton of adult male. Cephalic index 87.0.
35	C _A	Tifty, Fyvie.	Do.	<i>Cat. M. Coll.</i> , No. 26; <i>A.</i> , 257.	Cist with ashes.

* For notes to the Table, see p. 171.

Aberdeenshire—continued.

No.	Type.	Locality.	Preserved.	References.	Remarks.
36	C _A	Glaisterbury, Peterculter.	Mr Skene, Avonlow.	<i>P.S.A.S.</i> , xxxvi, 627; <i>A.</i> , 259a.	Cist, E.-W., with brachycephalic skeleton. Floor paved with pebbles packed in clay.
37	C _B	Bankhead, Pitligo.	Peterhead.	<i>P.S.A.S.</i> , xxii, 367; <i>A.</i> , 260.	
38	C _B	Slap, Turrit.	N.M.A., E.Q. 140.	<i>P.S.A.S.</i> , x, 740; <i>A.</i> , 264.	Cist, E.-W., with skeleton of adult and worked flint.
39	C _A	Upper Mains of Muresk, Turrit.	Do. E.G. 31.	<i>P.S.A.S.</i> , xx, 98.	Cist, E.-W., with skeleton of child. Floor paved.
40	C _A	Upper Royah- ie, Tyrie.	Do. E.Q. 295.	<i>Ibid.</i> , xliii, 79.	Cist, N.E.-S.W., with skeleton, charcoal and semicircular flint knife.
41	C _B	Do. do.	Do. E.Q. 206.	<i>Ibid.</i>	Cist.
42	C _B	Do. do.	Aberdeen.	<i>Ibid.</i>	Cist, N.E.-S.W., with charcoal, wood and skeleton of old man with brachycephalic skull. Floor paved with pebbles and slabs dressed.
43	C _B	Blackhills, Tyrie.	N.M.A., E.G. 48.	<i>Ibid.</i> , xliii, 87.	Cist.
44	C _B	Broomhill, Tough.	Do. E.G. 58.	<i>Ibid.</i> , lx, 18.	In sand-pit.
45	C _A	Bucklesat, Fyvie.	Do. E.G. 59.	<i>Ibid.</i> , lx, 98.	
46	F.	Kinalty, Dyce.	Do. E.G. 20.	<i>Cat. Ant. Soc. Scot.</i> , 36; <i>C.B.</i> , ii, 25.	Cist with female skeleton.
47	F.	Do. do. ^a	Do. E.G. 28.	<i>C.B.</i> , ii, 25.	Cist with skeleton.
48	F.	Parish of Glass, ⁷	Do. E.G. 42.	<i>P.S.A.S.</i> , xxxvi, 67.	Cist.
49	C _B	Erick, Newhills.	Aberdeen.	<i>Ibid.</i> , lx, 208; <i>Cat.</i> , <i>M. Coll.</i> , No. 29.	
50	C _A	Jolustone, Leslie.	Do.	<i>P.S.A.S.</i> , lxiv, 214.	Cist, N.E.-S.W., with two flint scrapers and bone fragments.
51	C _A	Mains of Leslie, Presnary.	Leith Hall.	<i>Ibid.</i> , xliii, 76.	Cist, N.E.-S.W., with charcoal and inhumant bone.
52	C _B	Do. do.	Mr Reid, Inverurie.	<i>Ibid.</i> , xlv, 344.	Cist.
53	F.	Do. do.	Aberdeen.	<i>Cat. M. Coll.</i> , No. 27.	Cist with bones.
54	C _A	Parish of Strichen.	Do.	<i>Ibid.</i> , No. 8.	Cist with skeletons of male aged 50 and person aged 14; also pebble, flint knife and tin cone.
55	C _A	Holland, Ellon.	Do.		

56	C _A	Keir, Belhelvie, Stoneywood, Avonlow, Do.	Do.	<i>Ibid.</i> , No. 5.	Cist with skeleton of female aged 22. Cephalic index 82.5.
57	C _A		Do.	<i>Ibid.</i> , No. 25.	
58	C _B		Do.	<i>Ibid.</i> , No. 30.	Cist.
59	C _B	Do.			In tumulus.
60	C _B	Do.			Beneath cairn in pit with burnt bones.
61	F.	Do.	N.M.A., E.E. 54.	<i>P.S.A.S.</i> , i. 137.	
62	C _B (H)	Do.	Do. E.Q. 335.	<i>Ibid.</i> , xxxvi. 675.	
63	C _A	Do.	Do. E.G. 57.	<i>Ibid.</i> , lx. 17.	
64	C _B	Do.	Unknown.		
65	C _A	Do.	N.M.A., E.G. 65.	<i>Wilson</i> i. 426; ii. 120. <i>P.S.A.S.</i> , lxxvii. 228.	Under tumulus. Cist, N.E.-S.W., with skeleton of male aged 25. Cephalic index 81.5.
66	C _A	Do.	Do.	<i>Ibid.</i> , lxxvii. 173.	Cist, S.E.-S.W., with quartz pebbles.
67	F.	Do.	N.M.A.	<i>Ibid.</i> , lxxvii. 37.	On original surface within recumbent stone circle.
68	B?	Do.	Unknown.	<i>Ibid.</i> , xxxvii. 230.	With charcoal near summit of natural mound.
69	C _B	Do.	Do.		
70	C _A	Do.	Do.		
71	B?	Do.	Do.		
72	C _B	Do.	Do.		
73	C _A	Do.	Do.		
74	C _B	Do.	Do.		
75	C _A	Do.	Do.		
76	C _A	Do.	Do.		
77	C _A	Do.	Do.		

Angus.

71	B?	Do.	Do.		
72	C _B	Do.	Do.		
73	C _A	Do.	Do.		
74	C _B	Do.	Do.		
75	C _A	Do.	Do.		
76	C _A	Do.	Do.		
77	C _A	Do.	Do.		

Angus continued.

No.	Type.	Locality.	Preserved.	References.	Remarks.
78	C ₁	Illynes, Kirkcub.	N.M.A.	<i>P.S.A.S.</i> , lviii, 24.	Cist, E.N.E.-W.S.W., with charred and incinerated adult bones. Piece of bone bears green stain indicative of bronze.
79	C ₁	Callerton Mill, Arbroath.	Do. E.G. 49.	<i>Ibid.</i> , xlix, 15.	Cist with skeleton.
80	C ₁	Fletcherfield.	Fletcherfield.	<i>Ibid.</i> , lxx, 418.	Cist, E. W.
81	?	Karne Hallock, Hill of Tealing.	Dumlee.	<i>Ibid.</i> , xxii, 346.	
<i>Argyll.</i>					
82	C ₁	Ballymenach, Kilmarin.	B.M.	<i>Ibid.</i> , vi, 348; lxx, 278; A, 185.	Cist, E.N.E.-W.S.W., under bell cairn with three skeletons. ¹⁰
83	C ₁	Pollalloch.	N.M.A., L.P. 13.	<i>P.S.A.S.</i> , xxxix, 242; A, 191.	
84	F.	Do.	Do. L.P. 15.	<i>P.S.A.S.</i> , xxxix, 242.	
85	F.	Do.	Do. do.		
86	C ₁	Do.	B.M.	<i>Ibid.</i> , vi, 344; A, 198.	In segmented chamber of neolithic cairn.
87	F.	Largie.			
88	F.	Pollalloch.			
89	C ₁	Callachally, Glenferrie.	N.M.A., E.Q. 137, 135.	<i>P.S.A.S.</i> , ix, 537; xi, 580; A, 217.	Cist with hammer and bronze riveted knife-dagger.
90	F.	Do.			
91	B?	Saken, Mull.	Do. E.Q. 269.	<i>P.S.A.S.</i> , xvii, 84.	
92	C ₁	Balnbraud, Campbelltown.	Campbelltown.	<i>Ibid.</i> , liv, 172.	Cist with flint fluke and two ornamented fragments of bronze.
93	F.	Tures.	Kelvingrove.	..	Cist, one of several secondary interments in round segmented chambered cairn, with flint knife, infumation and discoidal lignite bead.
94	F.	Do.			Domestic context.
95	B?	Call. Sanna Bay, Ardmurchlan.	Do. Unknown.	<i>Mon.</i> , 1927, No. 113.	Do. Kitchen-midden with flakes of flint and basalt, limpet shells and bone.
96	F.	Do. do.	Do.	<i>Ibid.</i>	Kitchen-midden.

No.	F.	Coh.	S.M.A., B.N. 14—		In gravel-pit.
			18.	19.	
97	F.	61 Gibe Street, Campbeltown.	Campbeltown.	..	
<i>Argshire.</i>					
99	C _h	Court Hill, Dalry.	S.M.A., E.G. 11.	P.S.A.S., x. 281; <i>Arch. Hist. Coll., Apr and Wigton</i> , i. 53, 55, A. 139.	Under urn. ¹¹
100	C _h	Murkirk.	Do.	E.G.A. 1.	In pit at centre of hut-circle No. 2. Carbonised oak lay at bottom of pit, which was packed with stones. ¹²
101					
102	F.	Do.	Do.	E.G.A.	On floor of hut-circle No. 2.
103					
104					
105	F.	Do.	Do.	<i>Ibid.</i> , lxi. 269.	Near hearth in hut-circle No. 1.
106	F.	Do.	Do.	<i>Ibid.</i> , lvi. 131.	In hut-circle No. 3.
107	F.	Wellwood, Murkirk.	Do.		Among scattered fragments of pottery at base of caldn.
108	F.	Do.	Do.		Cist with skeleton of adult male. Cephalic index 84.6. ¹³
109	F.	Hayles, Largs.	Unknown.	<i>Proc. R.S.E.</i> , xxvi. 270; <i>Arch.</i> , 62, pt. i. 246; A. p. 37.	On sand-dune area.
110	B	Do.	Greenock.		
111	F.	Shewalton Sands. ¹⁴			
<i>Banffshire.</i>					
112	C _h	Burkie.	Unknown.	<i>Requary</i> , i. 229; A. 267.	Cist with partially incinerated skeleton.
113	C _h	Carrestown.	Banff.	P.S.A.S., xxii. 309; A. 270.	
114	C _h	Dufford.	S.M.A., E.G. 1.	P.S.A.S., viii. 341; A. 272.	With skeleton in cist, N.-S.
115	C _h	Achnak.	Banff.	P.S.A.S., xxii. 309; A. 274.	
116	C _h	Burnside of Whitefield, Aberchirder.	Forglen House.	P.S.A.S., xl. 306; A. 276.	Cist with skeleton of child.

Banffshire—continued.

No.	Type.	Locality.	Preserved.	References.	Remarks.
117 118 119	Cb Ca Ca	Forghen.	Forghen House.	<i>P.S.A.S.</i> , xl. 279; <i>A.</i> 277-279.	In tumulus containing two pavements of pebbles at different levels. Nos. 117, 118 below second, and each rested on charcoal deposit. No. 119 in another charcoal deposit, beneath which was skeleton and barbed and stemmed arrow-head lying in scooped-out grave. Cist with bones.
120	?	Leamurdie.	Unknown.	<i>P.S.A.S.</i> , i. 205; <i>C.B.</i> , ii. 16.	
121	Cu	Do.	N.M.A., E.Q. 30.	<i>P.S.A.S.</i> , i. 205; <i>C.B.</i> , ii. 16; <i>A.</i> 280.	Cist, N.N.E.-S.S.W., with three flint chips, oxide of iron and skeleton of male. Cephalic index 85.6. Slabs cemented with loam and floor paved with pebbles.
122	Ca	Do.	Do. E.Q. 32.	<i>P.S.A.S.</i> , i. 205; <i>C.B.</i> , ii. 16; <i>A.</i> 281.	Cist, N.E.-S.W., with inhumed skeleton. Slabs cemented with loam and floor paved with pebbles.
123	Cu	Do.	Do. E.Q. 31.	<i>P.S.A.S.</i> , i. 205; <i>C.B.</i> , ii. 16; <i>A.</i> 282.	Cist, N.E.-S.W.
124	Cu	Gardenstown.	Unknown.	<i>Reliquary</i> , ii. 178; <i>A.</i> 283.	Cist.
125	Ca	Buckie.	N.M.A., E.G. 4.	<i>P.S.A.S.</i> , xvi. 415; <i>A.</i> 287.	With skeleton in cist.
126	Cu	Auchmore, Portsoy.	Banff.	<i>P.S.A.S.</i> , xvii. 369; <i>A.</i> 291.	
127 128	Ca Ca	Findlater Castle, Nether Buckie.	Unknown. B.M.	<i>Cordiner</i> , vol. iii.	Filled with ashes in cist, one of several beneath tumulus.

Berwickshire.

129	Ca	Manderston.	Unknown.	<i>B.N.C.</i> , x. 305; xxiv. 184; <i>A.</i> 187.	With skeleton in cist, E.-W.
130 131	Ca Cu	Hoprig, Cockburnspath.	Mr Cowe, Oxleythwa.	<i>B.N.C.</i> , xii. 131; xxiv. 103; <i>A.</i> 210, 211.	Cist, E.-W., at bottom of pit beneath cairn; pit filled with charcoal and burnt bones. Floor of cist paved with slabs.
132	Ca	Mackinnell, Gordon.	Mr Rouston, Greenlaw.	<i>B.N.C.</i> , xi. 194; xxiv. 186; <i>P.S.A.S.</i> , xx. 100; <i>A.</i> 212a.	In sand-pit.

133	F.	Gravellyknow, Dunfermline	N.M.A., E.C. 27, 56.	<i>B.N.C.</i> , v, 60; xxiv, 184; <i>P.S.A.S.</i> , lviii, 19.	Cist with male skeleton. Cephalic index 82.6.
134	C _A	Brounlyknow, Edinb.	Unknown.	<i>B.N.C.</i> , xxiv, 185; <i>P.S.A.S.</i> , xlvii, 172.	Cist, E.-W., with bones and ochreous stone. Floor paved with pebbles.
135	F.	Edington Mill, Chrisholm.	N.M.A., E.Q. 324.	<i>P.S.A.S.</i> , xlviii, 330.	Cist, E.-W., beneath cairn with skeleton, charcoal and food-vessel. ¹⁶
136	C _A	Harelaw Hill, Chrisholm.	Mr Mitchell-Jones, Whitehall.	<i>B.N.C.</i> , xix, 340.	Cist, E.-W., under cairn with bones and unworked flint.
<i>Bute.</i>					
137	F.	Dunan Bog, Lamlash, Arran.	N.M.A., E.P. 309.	<i>P.S.A.S.</i> , xliii, 343.	In compartment of long segmented chambered cairn with charcoal, inhumation, flint flake, two worked and one unworked fragment of <i>Corrigilla</i> pitchstone, piece of neolithic Type A and jet toggle. ¹⁷
138	F.	Giant's Grave, Whiting Bay, Arran.	Do., E.O. 265- 267.	<i>Ibid.</i> , xxxvii, 44; lxii, 29.	In segmented chamber of long cairn with fragment of neolithic Type A, four leaf-shaped arrow-heads and three knife scrapers of flint, one of which is plano convex. ¹⁸
139					
140					
141	F.	Gleekunbar, Bute.	N.M.A., E.P. 283, 284, 286, 287.	<i>Ibid.</i> , xxxviii, 37.	In chamber of long cairn with burnt bones, skeleton, flint flakes, flake of pitchstone and piece of quartz.
142					
143					
144					
<i>Caithness.</i>					
145	C _A ¹⁹	Acherah, West Watten.	N.M.A., E.G. 43.	<i>Ibid.</i> , xxxix, 418; A. 286 bis.	Cist with skeleton of young adult male whose cephalic index is 85.7.
146	F.	Lower Dounreay.	Do., E.O. 357, 360, 361.	<i>P.S.A.S.</i> , lxiii, 140; lxiv, 12.	No. 146 found in east, N.N.E.-S.S.W., in chamber of round-horned cairn. Cist paved and contained skeleton of dolichocephalic man aged 20-25, covered with beach shingle. Nos. 147, 148 embedded in layer of clay between uprights of chamber with human and animal bones, charcoal, stone axe and fragments of neolithic Type A.
147					Cist under cairn with two flint scrapers. Cairn associated with line of standing stones diverging in irregularly parallel rows from S.W. side.
148					In cist with skeleton and necklace of lignite discs. Cist in chamber of long-horned cairn.
149	B?	Garrywhin, Briann.	Unknown.	<i>Ibid.</i> , vii, 503.	
149a	B?	Yarrowes.	Unknown.	<i>Ibid.</i> , vii, 497.	

Dumbartonshire.

No.	Type.	Locality.	Preserved.	References.	Remarks.
150	F.	Old Kilpatrick.	Hunterian.	<i>P.S.A.S.</i> , lxiii. 37; <i>q.t.A.S.</i> (N.S.), vii. pt. ii. 55.	In oval grave, N.E.-S.W., with two neolithic vessels, one of Type B.
<i>Dumfriesshire.</i>					
151	C ₄	Archenburn, Closeburn.	N.M.A., E.G. 51.	<i>P.S.A.S.</i> , i. 162; <i>Cat. Ant. Scot.</i> , 1863.	In cairn with bones and two flint flakes.
<i>East Lothian.</i>					
152	C ₁	East Barns.	N.M.A., E.G. 41.	<i>P.S.A.S.</i> , xxxv. 277; <i>A.</i> , 197.	Cist with skeleton.
153	C ₄	Windy Mains, Humbie.	Do. E.G. 8.	<i>P.S.A.S.</i> , iii. 51; <i>A.</i> , 216.	Cist with bones.
154	F.	Do. do.	Do. E.G. 9.	<i>P.S.A.S.</i> , iii. 51.	Cist, E.-W., with unde skeleton. ²⁰
155	C ₄	West Links, North Berwick.	Do.	<i>Ibid.</i> , xxxiv. 123; <i>A.</i> , 218.	Cist with skeleton of young person.
156					
157					
158	B or C ₁	Archerfield, Gullane.	Do. H.R. 552.	<i>A.</i> , 220 (string-marked fragment); <i>P.S.A.S.</i> , xlii. 308.	Nos. 156, 157 in kitchen-midden No. 1, with wheel and limpet shells, coarse pottery and animal bones including red-deer horns. Nos. 158-161 in kitchen-midden No. 3, with fewer shells and bone, but C ₄ sherds, charcoal and flint scrapers and flakes.
159					
160					
161					
162	C ₄	Do. do.	Do. do.	<i>A.</i> , 219-221 (except string-marked fragment); <i>P.S.A.S.</i> , xlii. 308.	Nos. 162-179 in kitchen-midden No. 2, with bone pin and chisel, a knife, two scrapers and flakes of flint. Nos. 180-182 in kitchen-midden No. 3.
182					
183	B	North Berwick	Unknown.	<i>Ibid.</i> , xlii. 270; <i>A.</i> , 222.	At base of pillar of pebbles embedded in kitchen-midden No. 1, with flint, wheel, limpet and oyster shells, animal bones and fragments of neolithic pottery.
184	B or C ₁	Do.	N.M.A.	<i>P.S.A.S.</i> , xlii. 270.	Kitchen-midden No. 1.
185	C ₄	Do.	Do.	<i>Ibid.</i>	Do.

Inverness-shire—continued.

No.	Type.	Locality.	Preserved.	References.	Remarks.
206	F.	Longnæs Harp, North Uist.	N.M.A., E.O. 348-350.	<i>P.S.A.S.</i> , lxiii. 96; <i>N.U.</i> , 247.	In chamber of round cairn with turbed arrow-head, scraper and five flakes of flint, charcoal, burnt bones and perforated disc of mica.
207	F. ³⁴	Gairloch.	N.M.A., G.T. 49, 51-53, 231.	<i>P.S.A.S.</i> , lxiii. 96; <i>N.U.</i> , 253.	In chamber of round cairn with flint scraper and fragment of neolithic ware.
209	C _A	Kilmorie, Loch Slapin, Skye.	N.M.A., E.G. 60.	<i>P.S.A.S.</i> , lxii. 22.	With incriminated human bones in cist, N.E.-S.W., within margin of long cairn.
210	C _A	Kirkcubbin.	Aberdeen.	<i>Ibid.</i> , lxviii.	Cist, N.E.-S.W., with male skeleton.
211	C _A	Rudh'an Dunadh, Skye.	N.M.A., E.O. 382.	<i>Ibid.</i> , lxvi. 183.	In chamber of round cairn with quartz pebbles, pieces of green chert and pumice, charcoal and skeletons of young man, brachycephalic male aged 30-35 and two young children, one aged 18-20.

Kincardineshire.

212	C _B	Balbridie, Durrin.	Durrin House.	<i>P.S.A.S.</i> , xl. 304; <i>P.A.A.S.A.U.</i> , 1002-4, 22; <i>Cat. M. Coll.</i> , No. 20; <i>A.</i> , 234.	Cist, E.-W., with skeleton and charcoal.
213	F.	Do.	N.M.A., E.G. 45 (for No. 213).	<i>P.S.A.S.</i> , xl. 304; <i>P.A.A.S.A.U.</i> , 1002-4, 22; <i>Cat. M. Coll.</i> , No. 20.	Do.
214		Do.	Durrin House.	<i>P.S.A.S.</i> , xl. 304; <i>P.A.A.S.A.U.</i> , 1002-4, 22; <i>Cat. M. Coll.</i> , No. 20.	
215	C _A	Do.	Do.	<i>P.S.A.S.</i> , xl. 304; <i>P.A.A.S.A.U.</i> , 1002-4, 22; <i>Cat. M. Coll.</i> , No. 20; <i>A.</i> , 236.	Cist, E.-W., with bone and charcoal.
216	C _A	Kernoon Farm, Dunnotar.	N.M.A., E.G. 54.	<i>P.S.A.S.</i> , lvi. 17.	Cist.
217	C _B	Resting Hill, Dunnotar.	Do. E.G. 15.	<i>Ibid.</i> , vi. 89.	Cist.
218	C _A	Upper Mains of Catterline.	Aberdeen.	<i>Ibid.</i> , lviii. 27; <i>Cat. M. Coll.</i> , No. 1.	Cist, N.E.-S.W., showing cup-and-ring-markings on cover-stone, with quartzite implement and skeleton of male over 40. Cephalic index 85.0. Slabs dressed and floor paved with pebbles.

219	C _A	Banchory-Terrum.	Do.	<i>Cat. M. Coll.</i> , No. 24.	
220	C _B	Pitiot, Fetteresso.	Do.	<i>Ibid.</i> , No. 11.	With skeleton in cist beneath cairn.
221	C _B ²²	Parish of Kinnell and Cartcliffe.	Do.	<i>Ibid.</i> , No. 28.	Cist.
222	?	Loughillock, Portlathen.	Unknown.	<i>P.S.A.S.</i> , x, 105.	Cist.
<i>Kinross-shire.</i>					
223	C _A	Tillyochie.	N.M.A., E.G. 7.	<i>A.</i> , 214; <i>Cat. Ant. Soc. Scot.</i> , 1803.	Under cairn.
<i>Kirkcudbright.</i>					
224	C _B	Woodfield, Highbanks.	Kirkcudbright.	<i>P.S.A.S.</i> , xxv, 24; <i>Proc. D.G.A.S.</i> , 1926-8, 288.	With skeleton in cist. Floor paved.
<i>Lanarkshire.</i>					
225	C _A	Mossflat, Carluke.	N.M.A., E.G. 25.	<i>A.</i> , 180; <i>P.S.A.S.</i> , iv, 551.	Under cairn.
226	C _B	Lanarknoor.	Do. E.G. 18.	<i>A.</i> , 208, 209.	In sand-pit.
227	C _A	Lanark.	10.	<i>P.S.A.S.</i> , v, 214.	
228	C _A	Crawford.	N.M.A., E.G. 138.	<i>Anderson</i> , I, 58; ²⁶ <i>A.</i> , 213; <i>A.A.I.</i> , x, 7; xvii, 111; <i>J.R.A.I.</i> , 1902, 383.	With skeleton and bronze ring <i>r</i> in cist at centre of cairn.
229	F.	Wester Yird House, Carnwath.	Do. E.G. 105.	<i>Anderson</i> , I, 88; <i>P.S.A.S.</i> , x, 61.	Cist, N.-S., beneath cairn. Cover-stone exhibited cup- and ring-markings. ²⁷
<i>Middlethian.</i>					
230	C _A	Juniper Green.	N.M.A., E.G. 3.	<i>Arch.</i> , iv, 50; <i>A.</i> , 189; <i>C.B.</i> , ii, 15; <i>P.S.A.S.</i> , xxxix, 431.	Cist with skeleton of male over 50. Cephalic index 84.2. ²⁸ Slabs cemented with loam.
231	C _A	Cakemur Hill.	Do. E.G. 12.	<i>A.</i> , 206, 207.	Cista.
232	C _A	Borthwick.	13.	<i>P.S.A.S.</i> , ii, 482.	

Morayshire.

No.	Type.	Locality.	Preserved.	References.	Remarks.
233	C _u	Arnsa.	Elgin.	A. 268; <i>P.S.A.S.</i> , xxii. 342.	Cist.
234	C _u	Knockando.	N.M.A., E.G. 26.	A. 271.	
235	C _u	Near Elgin.	Elgin.	A. 275.	
236	C _u	Sheepie's Hill.	Do.	A. 284; <i>P.S.A.S.</i> , xxii. 343.	
237	C _u	Urcubart.	Do.	A. 285.	
		Gordonstown.			
		Elgin (1).			

Nairnshire.

238	C _u	Nairn.	Unknown.	A. 266.	
239	C _u	Cawdor Castle.	R.M.	A. 273; <i>P.S.A.L.</i> , i. (2nd series), 396.	Cist, E.-W., with skeleton, two awls and chisel of bone.
240	C _u	Auchindonne.	Inverness.	<i>I.S.S.F.C.</i> , i. 187;	
241	C _u	Cawdor.		<i>P.S.A.S.</i> , lxvii. 232.	Cists with skeletons.
242	C _u			..	
243	C _u		Cambridge.		Cist with skeleton.
244	C _u				

Peeblesshire.

245	C _u	Oliver.	N.M.A., E.G. 55.	<i>P.S.A.S.</i> , lviii. 13.	Cist.
246	B	Tweedsmuir.			
247	F.	Drumeldzier.	Do. E.Q. 394 (for No. 240).	<i>Ibid.</i> , lxxv. 357.	Cist, N.E.-S.W., beneath cairn with fragments of neolithic Type B, flint saw and thirteen flakes of flint and chert. Cairn with peripheral boulders yielded several secondary intermedia.

Perthshire.

248	C _u	Tippermuir. ²⁰	Stirling.	A. 192; <i>P.S.A.S.</i> , xxxiii. 145.	With skeleton, two scrapers, knife and flake of flint in cist. Floor paved with two slabs.
249	C _u	Netheven.		A. 200; <i>P.S.A.S.</i> , xxxii. 314.	With skeleton in cist. Floor paved with slabs.
		Baldlands.	N.M.A., E.G. 40.		
		Auchterarder.			

250	Cu	Fairies Knowe, Pendreich, Bridge of Allan.	Leat.	<i>Ibid.</i> , vii. 519; <i>T.S.A.S.</i> , 1920-7, 94; <i>A.</i> , 203.	At top of tumulus covering fire-injured cairn. At centre was cist containing charcoal and partially incinerated skeleton.
251	Cu	Kincaidine Castle.	N.M.A., E.G. 6.	<i>P.S.A.S.</i> , xii. 482; <i>A.</i> , 215.	With skeleton in cist. Floor paved with slabs, beneath which was second skeleton.
252	?	Edmont Castle, Meigle.	Unknown.	<i>C.B.</i> , ii. 25 (foot- note).	Cist with skeleton of brachycephalic female aged 17.
253	Cu	Balmuck, Comrie.	Do.	<i>P.S.A.S.</i> , xviii. 300.	Cist beneath mound.
254	Cu(H)	Do. do.	N.M.A., E.H. 8.	<i>Ibid.</i> , xviii. 306; <i>A.</i> , 203.	Cist, E.-W., at centre of mound.
<i>Ross and Cromarty.</i>					
255	?	Lachs, Lewis.	Unknown.	<i>P.S.A.S.</i> , lxii. 25.	With skeleton in cist.
256	Cu	Fyrish, Evanton.	N.M.A., E.Q. 131.	<i>Ibid.</i> , vi. 243; <i>A.</i> , 269; <i>A.</i> , 203.	Cist with bracer and skeleton. Cephalic index 82.3.
257	Cu	Eddertoun.	Unknown.	<i>A.</i> , 289.	Cist No. 3, one of six beneath tumulus with skeleton of aged brachycephalic individual.
258	Cu	Ross (?)	N.M.A., E.G. 22.	<i>A.</i> , 290.	In tumulus.
259	Cu	Tarradale.	Victoria and Albert.	<i>P.S.A.S.</i> , xxvii. 358.	
<i>Perthshire.</i>					
260	Ca	Eckford.	N.M.A., E.G. 38.	<i>P.S.A.S.</i> , xxv. 29; <i>B.N.C.</i> , xiv. 123; <i>J.R.A.I.</i> , 1902, 379; <i>A.</i> , 188.	Cist, E.-W., floor paved.
261	Cu	Near Littleton Castle, Kelso.	Do. E.G. 23.		
262	Ca	Wester Woodon, Eckford.	Do. E.G. 30.	<i>B.N.C.</i> , xl. 186.	Cist, N.E.-S.W., with charcoal, two flints and two pieces of chipped stone.
263	F.	Knock Hills, Edgerston.	Do. E.Q. 393.	<i>P.S.A.S.</i> , lxiii. 372.	Beneath cairn with skeleton.
264	F.	Not known.	Do.		
265	Cu	Friars, Kelso. ²¹	Do. L. 1933, 2116.		
266	Ca	Edenmouth.	Do. do.		
267	Ca	Lanton Tower, Jedburgh.	Unknown.	<i>Illustr. L.N.</i> , 14th January 1871.	With skeleton. Cist beneath tumulus with skeleton, flint scrapers and quartz pebbles.

Shetland.

No.	Type.	Locality.	Preserved.	References.	Remarks.
268	C _h	Unst.	N.M.A., E.G. 33.	<i>J.R.A.J.</i> , 1902, 380.	With skeleton of male aged 21-25 in dist. E.-W., beneath cairn.
269	F.	Fruga, Skatness.	Do.	<i>P.S.A.S.</i> , lxxvii. 34.	
<i>Stirlingshire.</i>					
270	C _h	Cambusbarrow.	Stirling.	<i>A.</i> , 103.	In sand-pit.
<i>Sutherland.</i>					
271	B	Cambusmore, Dornoch.	Dunrobin.	<i>A.</i> , 265.	Clst with eighteen quartzose pebbles, 118 shale discs, six perforated, and skeleton of female aged 18. Cephalic index 82.0. ¹²
272	C _h	Dunrobin.	Do.	<i>A.</i> , 286; <i>J.R.A.J.</i> , 1902, 380; <i>Reiquary</i> , 1904, 61.	
273	F.	Battyhill.	Unknown.	<i>A.</i> , p. 43, footnote 2.	
				Clst.	
<i>West Lothian.</i>					
274	B	Bathgate.	N.M.A., E.G. 47.	<i>P.S.A.S.</i> , xl. 369.	In sand-pit.
275	B	Do.	Do.	371; <i>A.</i> , 195.	(same).
276	C _h	Tortraven.	Do.	<i>P.S.A.S.</i> , lv. 12.	
			Do.	<i>Ibid.</i> , xxi. 190; <i>A.</i> , 202.	Clst.
<i>Wigtownshire.</i>					
277	F.	Glendue Sanda.	N.M.A., B.H. 527.	<i>P.S.A.S.</i> , lxiv. 291.	Domestic context on sand-dunes.
278	C _h	Do.	Kelvingrove.	<i>Ibid.</i> , xxxvi. 584; <i>A.</i> , p. 36.	Do. Contained three pieces of charcoal and necklce of 188 discs and triangular toggle of lignite.
279	F.	Do.	N.M.A., E.E. 40.	..	Domestic context on sand-dunes.
280					
281					
282					



Distribution Map of Early Bronze Age Beaker Pottery in Scotland.

M. E. CHUGHTON MITCHELL.

PLATE I.

[To face page 180.

283	C _b or B	Do.	Kelvingrove.	..	In bark-lined grave.
284	F.	Carscough Castle.	Unknown.	<i>Arch. Hist. Coll. Ayrshire and Galloway</i> , vi. 103; <i>P.S.A.S.</i> , ix. 517.	Cist, N.E.-S.W., with skeleton of brachycephalic female aged 30 and infant.
285 286 287	F.	Glenluce Sands.	Do.	<i>Ibid.</i> , vi. 104.	Buried in sand with stone axe and broken whetstone.
288	B or C _b	Do.	N.M.A., B.H. 8614-8683 (see section of unspecified Bronze Age pottery).	..	Domestic context on sand-dunes.
289 290	F.	Do.	Kelvingrove.		

MONDAY, 12th March 1934.

THE HON. LORD ST VIGEANS, Vice-President,
in the Chair.

Before proceeding with the ordinary business of the meeting, the Chairman referred to the great loss the Society had sustained through the death of Mr John Bruce, and moved a vote of sympathy with Mrs Bruce and family. This was unanimously carried and the Secretary was instructed to write Mrs Bruce accordingly.

A Ballot having been taken, the following were elected Fellows:—

WILLIAM BLACKWOOD, J.P., Lindores, Lyon Road, Harrow.

Rev. SAMUEL MARTIN JOHNSTONE, M.A., F.R.H.S., St John's Rectory, Parramatta, New South Wales, Australia.

NEIL McNEILL, of Ardmacross, 17 Fenchurch Street, London, E.C.3.

S. V. MORRIS, "Woodlands," Newham Grange Avenue, Stockton-on-Tees, Co. Durham.

Rev. JOHN N. M. PATERSON, The Manse, King Williams Town, C.P., South Africa.

The following Donations to the Museum were intimated and thanks voted to the Donors:—

(1) By VICTOR J. CUMMING, F.S.A.Scot.

Two Table-spoons (Edinburgh); one (Aberdeen); one (Perth); one Tea-spoon (Aberdeen), and a Toddy-ladle (mark C.T.), all of Silver.

(2) By D. W. F. BADEN-POWELL, Stone End, Hinksey Hill, Oxford.

Leaf-shaped Arrow-head, measuring $\frac{1}{4}$ inch by $\frac{1}{2}$ inch, and a struck Flake, both of white Quartz, found near the Stone Circle at Callernish, Lewis.

Rim fragments of dark grey pottery; Stone Whorl, measuring $\frac{1}{4}$ inch in diameter and $\frac{1}{16}$ inch in thickness, and Iron Knife, the blade wedge-shaped, measuring $2\frac{1}{2}$ inches in length, found at the kitchen-midden near the earth-houses at Galson, Lewis.

(3) By FRANCIS CHALMERS, W.S., F.S.A.Scot.

Two Bottles of dark olive-green Glass, one of "mell" shape, measuring

5½ inches in height, and the other bearing the stamp CULLODEN on the side, measuring 10½ inches in height. The second bottle was used for whisky made at Ferintosh Distillery, which belonged to Forbes of Culloden, who held the monopoly for distilling whisky free of duty, from barley grown on the estate of Ferintosh.

(4) By Provost J. D. HAGGART, O.B.E., F.S.A.Scot.

Socketed Bronze Axe, the socket square with rounded corners and the loop complete; there is a moulding round the mouth and another slightly lower, below which are three hanging ribs on each side. The axe is 3½ inches long and 1½ inch across the cutting edge, the socket being 1⅞ inch square externally. Found in the River Teith, at Callander, Perthshire.

The following Purchases were made for the Museum:—

Flat Copper Axe, measuring 4½ inches in length and 2½ inches across the cutting edge, found on Doune Hill, Dunbar, East Lothian.

Stone Axe, measuring 4⅞ inches in length, 2½ inches in breadth, and 1⅞ inch in thickness, found on the surface of a sandy knove near East Burrafirth, Bixter, Shetland.

Object of Steatite, shaped like a shoe, with a large oval cavity on the top at one end, connected by a groove or duct with a small circular indentation at the other, measuring 11½ inches in length, 4½ inches in greatest breadth, and 3½ inches in height, found at Mellon, Laide, Anchnasheen, Ross-shire.

Penaunular Ring of hollow triangular section, of Gold (fig. 1, No. 1), measuring 2½ inches in diameter and 1⅞ inch in thickness at the centre; the top and bottom plates are entirely covered with very small concentric corrugations; weight, 18 dwts. 15 grs. Bow-shaped Dress-fastener of Gold, the ends of the bow, which is ribbed longitudinally, having thin flat, almost circular terminals set nearly at right angles to each other; the length of the bow is ⅞ inch, and the diameter of the terminals ⅞ inch; weight, 1 oz. 7·22 grs. (fig. 1, No. 2). Sun-disc of Copper, imperfect, measuring 2½ inches in diameter, formed of a thin plate of metal of concavo-convex section (fig. 1, No. 3). The convex face is decorated by engraved lines. In the centre is a group of nine dot and circle patterns. There is a large one in the centre with three circles, and it is surrounded by eight of smaller size with only two circles. Round the margin are dot and three-circle designs, the space intervening between them and the central group being filled with circular concentric grooves. On the back is a projection, probably the remains

of a stud for fixing the object to its stand. The thick gold-foil which covered the surviving part of the disc, and which is detached, shows similar designs (fig. 1, No. 4). The objects were probably found on the Torloisk estates in Mull.



Fig. 1. Sun-disc and Gold Ornaments, probably found in Mull. (2.)

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By JAMES CURLE, LL.D., F.S.A.Scot.

Masada, die Burg des Herodes und die Römischer Lager mit einem Anhang: Beth-Ter. By Professor Dr Adolf Schulten. Leipzig, 1933.

(2) By L. M. ANGUS-BUTTERWORTH, F.S.A.Scot.

Ancient Monuments Society. Year Book and Proceedings, 1932. Manchester.

(3) By RICHARD QUICK, F.S.A.Scot.

Proceedings of the Bournemouth Natural Science Society, vol. xxv. 1932-33.

(4) By Professor P. BOSCH-GIMPERA, The University, Barcelona.

Fontes Hispaniae. Fasciculus I. Avieni, ora Maritima, edidit A. Schulten, Barcelona, 1922. Fasciculus II. 500 a de J. C. Hasta César. Edición de A. Schulten. Barcelona, 1925.

Universidad de Barcelona Facultad de Filosofía y Letras: La Civilización Megalítica Catalana y la Cultura Pirenaica. By el Dr Luis Pericot Y García. Barcelona, 1925.

La Cultura del Vaso Campaniforme (Su origen y extensión en Europa). By Alberto del Castillo Yurrita. Barcelona, 1928.

Sagunto. By Manuel González Simancas. Barcelona, 1929.

Les Iles Baléares. By J. de C. Serra-Ràfols. Barcelona, 1929.

Le Musée Archéologique National de Madrid. La Section Première. By Francisco Alvarez-Ossorio. Barcelona, 1929.

Numance. By B. Taracena Aguirre. Barcelona, 1929.

Mérida. By José R. Mérida. Barcelona, 1929.

Azaila. By Juan Cabre-Aguilo. Barcelona, 1929.

La Civilisation Ibérique du Bas-Aragon. By P. Bosch-Gimpera. Barcelona, 1929.

Le Musée Archéologique de Barcelone. By P. Bosch-Gimpera et J. de C. Serra-Ràfols. Barcelona, 1929.

Tarragone. By Joaquín M. de Navascués. Barcelona, 1929.

Altamira. By M. Hugo Obermaier. Barcelona, 1929.

Les Monnaies Hispaniques. By José Ferrandis Torres. Barcelona, 1929.

The following Communications were read:—

I.

EXTERNAL FEATURES OF RUDH' AN DUNAIN CHAMBERED CAIRN.

By W. LINDSAY SCOTT, F.S.A.Scot., F.S.A.

The excavations described in a previous paper¹ were continued in September 1932 with a view to completing the investigation of the forecourt and to tracing the peristalith. As was anticipated from the denudation of the southern side of the cairn, the southern half of the forecourt was almost completely wrecked, and in the neighbourhood of the stone dyke which cuts through the skirts of the cairn the peristalith had disappeared. On the northern and western sides, on the other hand, the peristalith was not seriously damaged except where orthostats had been stolen.



Fig. 1. Southern part of Forecourt Façade, looking south east.

THE FORECOURT.

Structure.—The axis of the forecourt was found to lie east by south, and one point to the north of that of the chamber, antechamber, and vestibule, which lies east-south-east (Pl. II.). Accordingly the forecourt is much narrower and more enclosed than the plan of the northern half given in Pl. VI.

of my former paper suggested. The partially fallen orthostat Q.1 lying immediately to the south-east of the portal was not fully excavated in 1931, and its original position was not correctly shown in the 1931 plan.

¹ *Proc. Soc. Ant. Scot.*, vol. lxi, pp. 182-213. The latitude and longitude of the cairn are not quite precisely stated on p. 186 of that paper. The correct position is: lat. 57° 51' N., long. 6° 18' 43" W.

Q.1 had not reached the ground along the whole length of its foot, but had been supported upon a block of stone at its southern end. Beyond Q.1 was a length of walling standing to two courses (A in fig. 1). Beyond that an orthostat had completely disappeared: the hole in which it had stood (B in fig. 1) was traceable in the 6 inches of peaty soil which cover the solid rock and is shown dotted in the plan. The next panel of walling (C in figs. 1 and 2) stood to only one course. The succeeding orthostat (D in figs. 1 and 2) lay fallen forward over a large building block, on which its base now rests. Of the next following panel



Fig. 2. South Horn, looking north-west.

of walling only a single block (E in fig. 2) remained, and there was no trace of the orthostat which should have stood immediately to the south-west of it. After this gap a panel of walling was found three courses in height; the block forming the second course was split across, and, as shown in Pl. II., one end had been twisted round carrying the block forming the third course with it. In fig. 2 these blocks are shown at F restored to their original position. This panel of walling is unusual in that behind the lowest course is a parallel block which serves no evident purpose.

The most interesting discovery in the forecourt was that, lying outside and against the prostrate block which faces the portal, was a second slightly smaller one (fig. 3). Its flat upper surface was approximately level with that of the inner block, which, it may be recollected, was wedged up so as to present a horizontal upper face.

A careful investigation was made to ascertain whether the position of these blocks was original: the smaller block was removed and replaced, and the floor around both blocks was examined. It was ascertained that there was a hole, 6 inches by 5 inches by 4 inches deep, in the original



Fig. 3. Prostrate Slabs in front of Portal with partially fallen Orthostat Q.1 behind.

peaty floor in the position shown by a dotted curve in Pl. II., and that of the two wedges mentioned in my former paper as supporting the larger block only one (that shown on the right in fig. 3) was actually taking any weight. We know from Professor Childe's excavation of the Old Keig stone circle in Aberdeenshire¹ that orthostats could be held in position by remarkably small stone wedges, and that it was not necessary to bury their bases in any depth of soil. I do not think, however, that it is conceivable that the smaller block once stood vertical in the small hole in the peaty covering of the rock floor, and there was no evidence at all that the larger block had ever been upright. Their present position must, I think, be accepted as their original one.

The finding at *Punt y Saer* chambered tomb, Anglesey,² of

a wall surrounding the forecourt suggested the desirability of confirming that the forecourt at Rudh' an Duinain was unenclosed. No evidence of an enclosing wall was found in excavating the wrecked south horn, and a larger area was examined without result round the virtually undamaged north horn. I think, therefore, that the forecourt may be regarded as an open one.

Artifacts.—In my former paper I recorded the finding of the following

¹ V. G. Childe, *Proc. Soc. Ant. Scot.*, vol. lxvii, p. 37 ff.

² *Arch. Camb.* (December 1933), p. 185 ff. Two Sardinian Giants' Tombs (D. Mackenzie, *Mennan*, vol. ii, p. 190 ff.) seem to have had a convex line of walling joining the points of the horns.

artifacts in the area of the forecourt between the portal and the prostrate blocks:—In the peaty covering of the rock floor, two fragments of pottery with incised parallel lines, which were probably neolithic; above the peat, three pieces of pumice and a natural stone showing signs of human use. In the present excavations a small fragment of pottery was found on the surface of the peat 2 feet east of the prostrate blocks. The ware was fine, $\frac{1}{4}$ inch thick, black internally and buff on the surfaces; it probably belonged to the beaker period. The only other artifact found was a roughly shaped piece of flint of poor quality cracked by fire. This was lying 1 foot above the peat-level and 3 feet south-east of Q. 1.

Evidence of Burning.—Apart from a minute trace of charcoal on the peat floor recorded in my former paper the only possible evidence of burning in the forecourt was a few red particles in the peat close to the point of the north horn. The ash of modern peat in the peninsula is brick red; peat may also be stained red by stagnant water containing iron, though the presence of standing water is unlikely here. The evidence of burning in the forecourt is virtually negligible, and it is clear that no substantial fires were made on the floor of the forecourt either opposite the portal or in the neighbourhood of the façade.

Evidence of Wrecking.—The degree to which the cairn material on the south side of the forecourt had been removed was shown by the remains of a large fire 6 inches below the modern surface and 1 foot 9 inches above the peat floor in an area between 2 feet and 4 feet east of Q. 1. The red ash of this fire contained a large iron bolt from a ship's timber, the fuel having been obtained from the driftwood which comes up in Camas a'Mhúrain. This fire was presumably the work of the people who built the stone dyke which skirts the cairn on the south-west.

THE PERISTALITH.

As will be seen from Pl. II., the peristalith was explored for a distance westwards from the point of the north horn, and sections were cut at intervals round the cairn. The orthostat at the point of the horn was missing, but the section beyond that was only slightly damaged. The broad orthostat on the left in fig. 4 had had its upper part broken away with a pick, and the pillar-shaped orthostat on the right had had its head broken off. The head was found on the surface of the cairn and is replaced in the photograph. The intervening wall was tilted outward by the pressure of the cairn, but was undamaged except for a chip hacked off one corner by a pick.

A fact of considerable interest is that, as will be seen from fig. 4, a number of blocks of building stone are lying outside the peristalith. These could not, from their number and their position, have been fallen

blocks from the wall, and there can be no doubt that they represent surplus building material left on the site as a contribution to the covering cairn of stones. The same phenomenon was seen in other sections of the peristalith. There is, of course, nothing surprising in this, since the ritual efficacy of the peristalith as the wall of a sacred enclosure would not be affected, but the practice does not seem to have been noted elsewhere. It is a confusing one to the excavator, and it may be worth bearing in mind that not every building stone found on the site of a chambered tomb need be interpreted as part of the original structure.











Fig. 4. Section of Peristalith immediately west of North Horn.

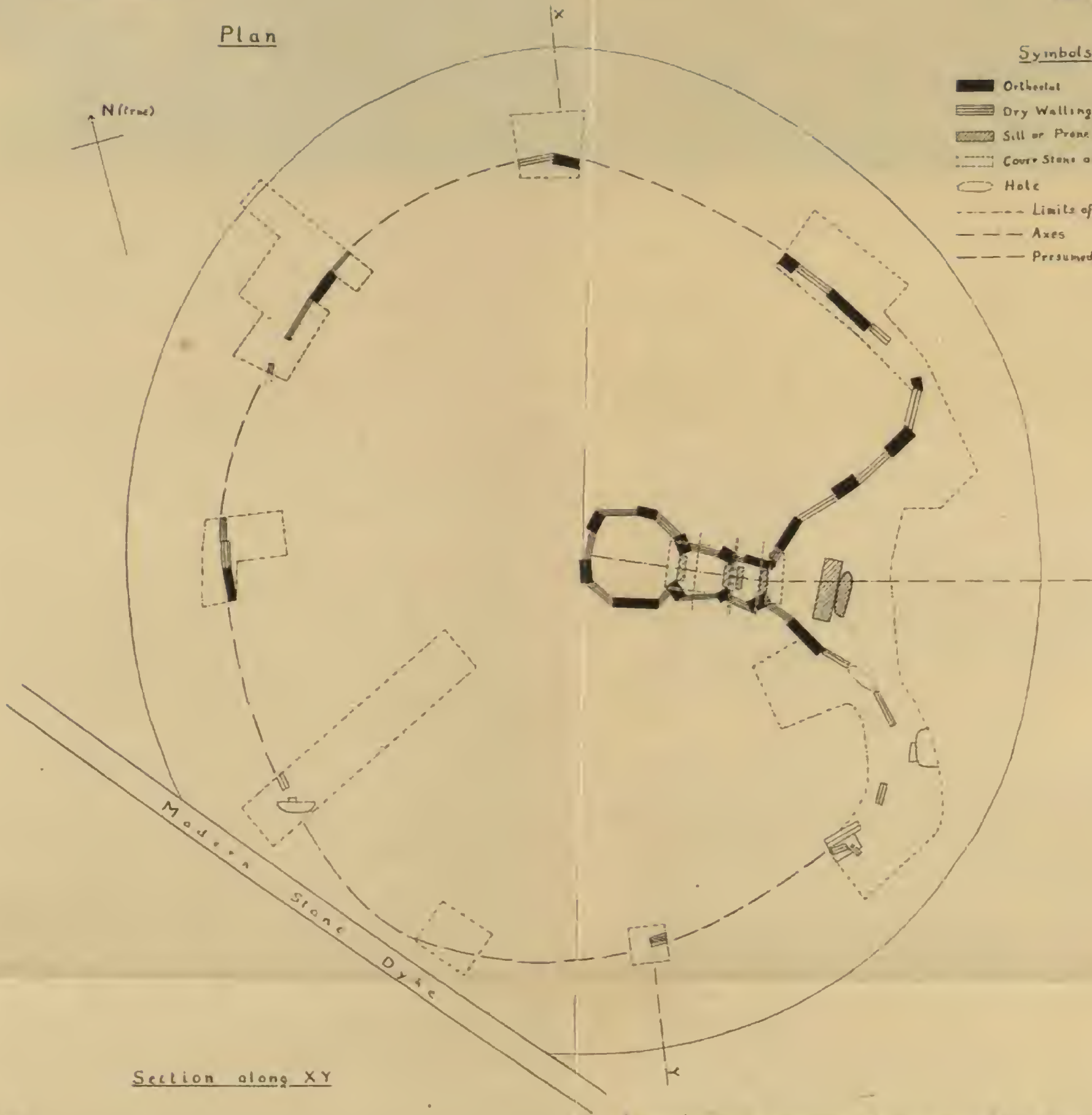
It is hardly necessary to describe the other sections of the peristalith as the structural features are sufficiently indicated in Pl. II. The sections on the north and west sides showed the wall to be not seriously damaged, though one orthostat was found to have been stolen. On the south-west side of the cairn in the neighbourhood of the stone dyke the peristalith had been largely destroyed. The long trench produced only the lowest course of walling and a block which had probably been split from an orthostat; the next section, immediately against the dyke, produced nothing; and the pit between that and the point of the south horn produced a panel of walling standing to its full height, but not the orthostat which should have been its neighbour.

It can safely be assumed that the peristalith was regularly formed by alternate orthostats and panels, the panels rising to a height considerably less than the orthostats. These panels were formed either of

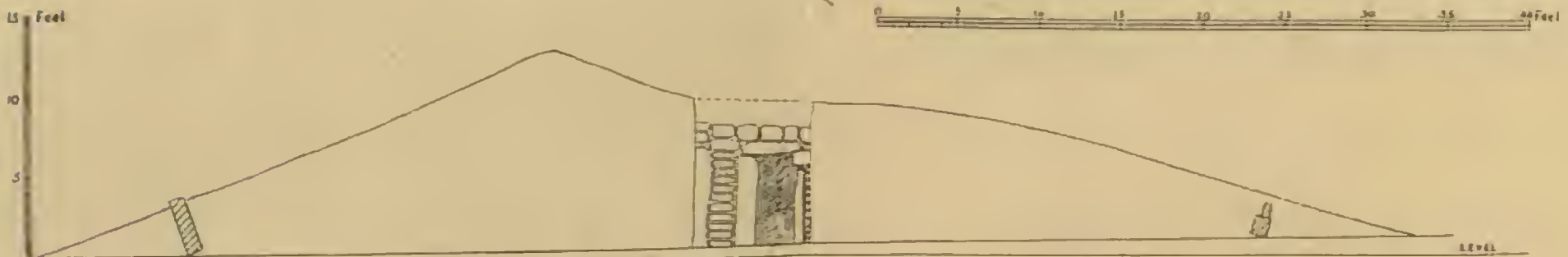
Plan

Symbols

-  Orthostat
-  Dry Walling
-  Sill or Pene Slab
-  Cover Stone or Linel
-  Hole
-  Limits of Excavations
-  Axes
-  Presumed Line of Peristalith



Section along XY

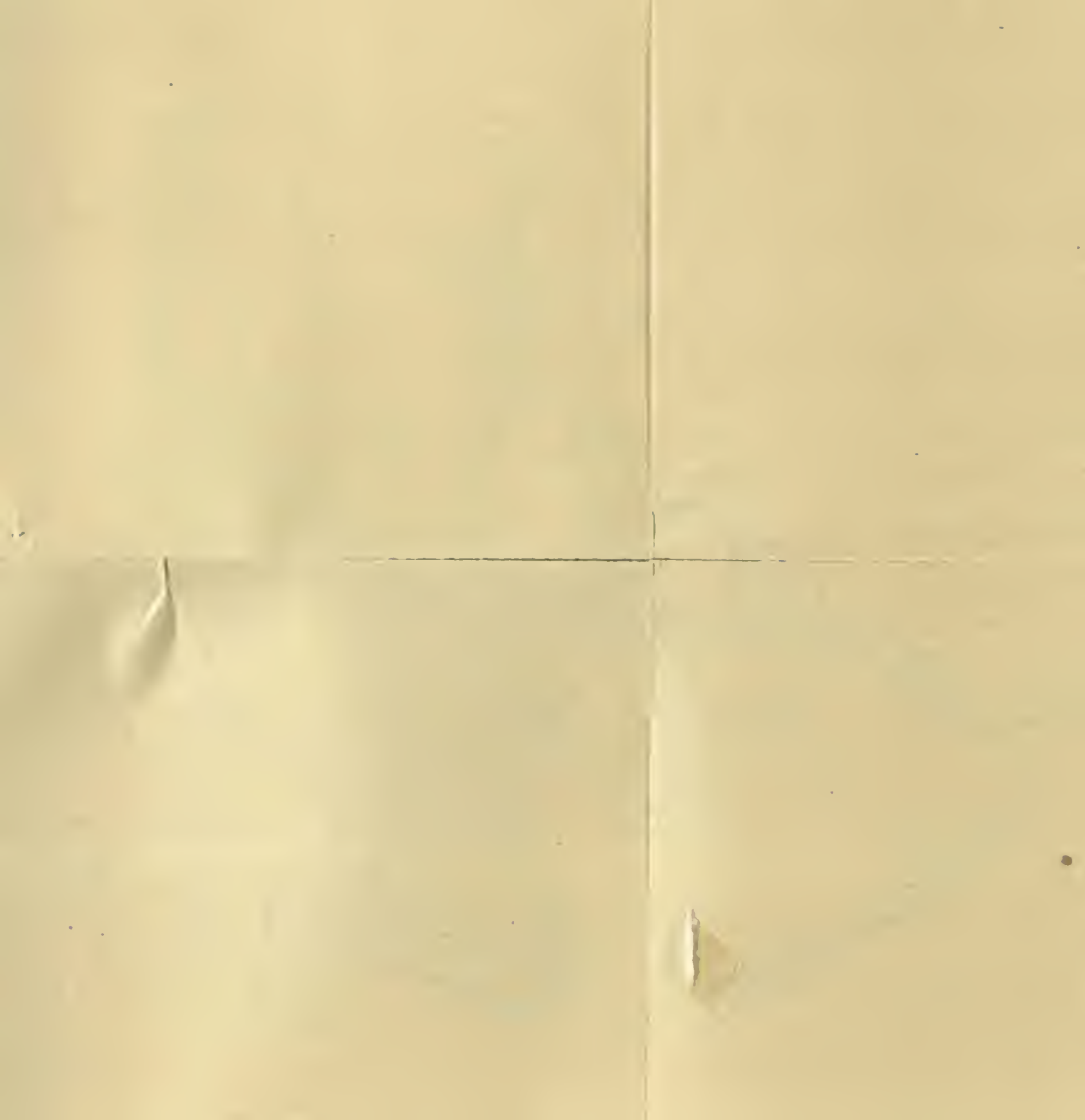


W. LINDSAY SCOTT.

Plan and Section of Cairn at Bude' an Dainn.

PLATE II.

[To face page 100.]



large rectangular blocks set in courses or of thin, roughly rectangular slabs set on edge; both blocks and slabs were of the fine-grained basalt used for the roofing of the chamber of the tomb, which splits remarkably accurately along planes at right angles to one another.

Use of Water-worn Pebbles.—Large numbers of water-worn pebbles of anything between 2 and 5 inches in greatest diameter were found against the peristalith, both inside and outside it. These were no doubt brought from the neighbouring beach of Canaas a'Mhurain. I doubt their utilitarian purpose, since rounded stones form very poor packing material, and much more suitable packing was available in the building blocks left strewn unused on the site. The frequent use of water-worn pebbles in connection with burials in this and the immediately succeeding period shows that they were regarded as of ritual significance, and I think it probable that this was their purpose at Rudh' an Dunain.

Use of Quartz.—As in the forecourt, quartz pebbles were found at the foot of the peristalith and also above it, but they were rare. No sea-shells, animal teeth or bones, and no artifacts were found in the excavation of the peristalith.

STRUCTURE OF THE MOUND.

A long trench, shown in Pl. II., was carried from the south-west skirt of the cairn nearly into its centre. At its inner end its walls stood 8 feet above the floor, and to continue it further with the means at my disposal would have been unduly dangerous. The material of the cairn was found to consist of large stones, the great majority of which were rounded and no doubt brought from the neighbouring beach. Many of these, particularly in the lower levels, were of great size, weighing two or three hundredweight. No evidence of structure was discovered inside the peristalith; only one isolated building slab was met with, at a distance of 7 feet inward from the peristalith, and this, though set on edge, did not reach the floor.

A small area was also cleared behind the southern façade of the forecourt. This disclosed two building stones which had probably served to pack the base of the partially fallen orthostat Q.1.

These limited excavations in the interior of the mound cannot, of course, prove that there is no structure, such as a second wall or a ring of standing stones, inside the peristalith. I think, however, that they make it rather unlikely.

In my judgment the mound has not suffered denudation on its northern and eastern sides, and it follows that the heads of the orthostats of the forecourt façade and the peristalith were originally exposed.

II.

EXCAVATION OF RUDH' AN DUNAIN CAVE, SKYE.

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In other papers¹ I have reported the excavation of the chambered tomb which lies near the apex of the now deserted promontory of Rudh' an Dunain, and have given some description of this isolated area lying to the west of the Cuillin Hills in Skye. The only evidences hitherto recorded of the ancient use of the peninsula are the tomb and the fine promontory broch or "galleried dun" which stands at the opposite end of Loch na h'Airde. On examination, however, the relatively fertile area in the neighbourhood of the loch shows other evidence of early habitation, namely, two cairns—one of moderate size, standing to a height of 5 feet, and one small—two groups of hut-circles, and the cave which is the subject of this paper.

SITE OF CAVE.

The cave stands in lat. 57° 9' 50" N., long. 6° 18' 5" W., at a distance of about 500 yards east of the loch, and of about 100 yards south from the stream which runs into the loch from the east. It is cut in a vertical rock-face on the 100-foot beach level, and the ground falls sharply away from the front of it. It is a small and particularly shallow cave, the area covered by the roof being 15 feet in greatest width and 9 feet in greatest depth (Pls. III. and IV.), and, since it faces west, it is particularly exposed to driving rain. Water does not percolate through the roof, but it runs in quantity over the edge of the cliff above and works backward into the cave. A large slab (shown in Pls. III. and IV.) and some smaller blocks have fallen from the roof since the use of the cave described below; these rock-falls may have increased the runnels of water which find their way into the cave during rain.

EXCAVATION.

With the kind consent of Macleod of Macleod and of the tenant of Glen Brittle, Mr Macrae, excavation was undertaken by my wife and myself in September 1932. A trench was cut through the centre of the opening from outside the cave, and the interior was entirely excavated save for the part covered by the large slab fallen from the roof. The

¹ *Proc. Soc. Ant. Scot.*, vol. lxxi, p. 183 ff., and vol. lxxiii, p. 104 ff. A sketch plan of the area is given in the former of these papers.

material found was classified in four strata, A to D, as shown in Pl. IV. The material was also classified in a number of areas, which, upon ultimate examination of the objects, were amalgamated into five areas, named I. to V. in Pl. III. These five areas and four strata give twenty "regions" for the purposes of classification of the excavated material, but owing to the sloping up of the rock floor stratum D is not represented in area III. and the number of effective regions is therefore nineteen. In making statistical deductions from any such classification it is necessary to bear in mind that the regions are not of equal volume.

FILLING OF THE CAVE.

Apart from fallen roof blocks the filling of the cave consisted of finely divided peaty earth, and, at the bottom, of a thin layer of sea sand. The peat appeared to have filtered in with the runnels of water which descended from the cliff above; whether this process had commenced at the time of the earlier occupation of the cave, or only began later, cannot now be determined.¹ It is at any rate the fact that, above the sand, there was no visible differentiation in the character of the filling throughout its whole depth. Remains of human occupation were found at all depths in the peaty soil and in all areas, but not in the sand on the cave floor.

SEQUENCE OF OCCUPATION.

It will be convenient to state at once, as a framework for the subsequent description, the successive uses to which the cave had been put. At the lowest level, immediately above the sandy floor, were found pottery fragments, including beaker, and such quantities of the refuse of stone-working occurred in this and the immediately superior stratum as to show that the cave had been used as a stone-knapper's workshop. The paucity of post-beaker pottery sherds makes it unlikely that this occupation continued without a break until the second definable period. This occurred in the Early Iron Age, when, as is shown by a smelting furnace and iron slag, the cave was used for iron-working. Subsequent occupation was probably only occasional; a few fragments of pottery may indicate casual use in the earlier centuries of the present era, and some modern use as the occasional shelter of a shepherd or a gipsy is shown by an iron nail, fragments of an iron pot, and the slight attempt at walling shown in Pl. III.

I do not think that the cave has ever been used as a permanent

¹ There is evidence from the neighbouring cairn that only a slight growth of peat had taken place in the peninsula before the tomb was built. As shown below, this event cannot have antedated the first occupation of the cave by more than a few centuries.

dwelling. No domestic hearth was found; pottery fragments and animal bones were relatively scarce; the worked-stone objects were in hardly any instances completed implements; and, despite the smelting furnace, there were no iron implements. The group of hut-circles at the foot of the slope above which the cave stands may well represent the hamlet whose successive generations of stone- and iron-workers came up to work in the cave. A modern story that, about a century ago, a widow brought up a large family there, supporting them by fishing and by gifts received from her neighbours, is, I fear, a myth.

EVIDENCE OF DISTURBANCE.

It is inevitable that in a small cave the later occupiers should dig into the floors into which their predecessors' debris was trodden. In areas II. and IV. this type of disturbance had occurred on a large scale, since the smelting furnace had been dug through stratum C (*cf.* Pl. IV.).

Unhappily, however, there are other sources of disturbance to report. Starting in stratum C below the furnace, a burrow ran outwards and downwards and passed under the large block marked "Ancient fallen rock" on Pls. III. and IV. The burrow was circular in section and from 4 to 6 inches in diameter; its inner surface was smooth and hardened by water. It served as an excellent and much-needed drain for the cave. I do not think that there is any doubt that it was originally made by a rabbit, since rabbit bones were found near its inner end. Since rabbits are a mediæval importation into Britain the burrow must date from recent times. There were also short burrows running upwards from the region of the furnace through areas I., III., and IV., which are probably also due to rabbits.

Nor can recent disturbance by man be entirely disregarded. In region IV. A, 6 inches below the present surface, was found a modern iron nail imbedded in disintegrated wood. In region II. B were fragments of an iron pot which was probably not ancient, and, if this is so, some relatively recent user of the cave must have dug into the surface to a depth of 1 foot. There were no other objects which need be attributed to modern times, but considerable remains of a sheep in stratum A no doubt represent a more or less recent fatality of the moors.

In these difficult circumstances resort to statistical methods is clearly required, and, when the number of objects justified it, such methods are used below. The table on p. 208 giving the distribution of slag may be used as a test of the degree to which deposited objects are disturbed, since slag cannot antecede the smelting furnace which was in areas II. and IV., its floor being approximately in the plane of separation of strata B and C. Slag is, of course, less easily moved about than pottery

fragments or stone chips, but some of the pieces are extremely small and its distribution gives a rough guide to the degree of disturbance.

Study of the table shows that small quantities of slag (1.9 per cent. of the total) were found in stratum A in areas I. and II. This must be due to recent disturbance. The main mass of slag (73.3 per cent. of the total), is in stratum B, *i.e.* on and above the level of the floor of the furnace, but a substantial amount (23.4 per cent. of the total) was found in stratum C, into which the furnace had been dug. With the exception of a single small piece in region V. B, the whole of the slag in strata B and C was found in areas II., III., and IV., *i.e.* immediately around the site of the furnace. In stratum D a small quantity of slag (1.4 per cent. of the total) was found in areas II. and IV. below the furnace, but areas I. and V. each contained only one very small piece.

We can infer from these data that in areas II. and IV. objects belonging to strata B and C are completely mixed, and that stratum D is sufficiently disturbed to make reliance on stratification impossible. The evidence for vertical disturbance in areas I. and V. is negative. Only two small pieces of slag were found in these areas in stratum D and none in stratum C, but equally there was only one small piece in stratum B, showing, somewhat surprisingly, that the slag was not distributed horizontally in the cave when the industry was being carried on. All that can be said, therefore, is that the iron industry was not itself a cause of substantial disturbance in these areas. On the other hand, it can, I think, be inferred from the presence of only one piece of slag in area V. in strata C and D that the burrow-drain did not operate to carry down material from areas II. and IV. to an appreciable degree. A source of horizontal disturbance of area V., which might *prima facie* have been expected to be serious, can therefore be to a large degree disregarded.

Some light on the effect of other sources of vertical disturbance in areas I. and V. is thrown by the table of distribution of worked-stone objects on p. 204 below. Assuming for the moment that, as is argued below, the stone industry was confined to a period before the iron-smelting began, and therefore belongs to strata C and D, the figures in the table show that the degree to which objects were carried upwards in areas I. and V. was slight. Of forty-two worked-stone objects in these areas all but two were found in strata C and D, *i.e.* 95 per cent. were found at appropriate levels. This evidence does not show, of course, that objects were not carried downwards in these areas, since *ex hypothesi* there were no worked-stone objects originally in strata A and B.

The evidence of the pottery in area I. is as follows:—Stratum D contained nine sherds—four of beaker, three of a vessel datable to the

same period, and two undecorated sherds which, on grounds of texture, are most likely to belong to the Iron Age. Stratum C contained three sherds—one belonging to the vessel last named, one indeterminate, and one of an Iron Age vessel of which three fragments occur in II. A. Stratum B contained two sherds—one of a beaker period vessel represented in stratum D and one of a typical Early Iron Age rim.

In area V. stratum D contains four small undecorated sherds—two probably of Bronze Age date, one probably of the Iron Age, and one indeterminate. Stratum C contains six sherds—four of beaker, one of a vessel which by analogy belongs to the same period or slightly earlier, and one rim fragment of Early Iron Age date. Stratum B contains one and stratum A two sherds of Iron Age type.

The pottery evidence, so far as it goes, indicates only a moderate degree of movement, whether up or down, in the two areas I. and V. In the other areas there are signs of much more disturbance.

Taking the evidence as a whole I think that we may conclude that, while stratification in areas II., III., and IV. is quite unreliable, in areas I. and V. a substantial majority at least of the objects are undisturbed. The expectation that any particular object found in these areas is in its original position is therefore a fairly large one. This is no doubt a modest conclusion, but it is, I think, all that the facts warrant.

STONE-KNAPPING INDUSTRY.

I propose to describe the two industries carried on in the cave and then the other objects found. The earlier industry was stone-knapping, and this was represented by 219 implements, cores, and chips distributed as follows:—

Distribution of Worked-stone Objects.

Strata.		Areas.					All Areas.	
		I.	II.	III.	IV.	V.	Number.	Percentage.
A		1	8	5	..	..	14	6 ⁴ / ₁₀
B		1	15	12	11	..	42	19 ⁰ / ₁₀
C		7	3	9	63	1	83	38 ⁰ / ₁₀
D		17	6	.	12	15	50	23 ⁰ / ₁₀
All Strata.	Number.	26	32	26	119	16	219	100 ⁰ / ₁₀
	Percentage.	12	15	12	54	7	100	...

Looking at the horizontal distribution it may safely be inferred from this table that the industry was mainly carried on in area IV., that is, in the centre of the front of the cave just within the shelter of the roof. From the vertical distribution considered over the whole area of the cave it might be concluded that the industry was carried on continuously from the first use of the cave till the time of its use as a smelting workshop and to a lesser degree after that. I do not think, however, that this would be a sound conclusion. Having regard to the disturbance proved by the evidence of the slag to have occurred in areas II., III., and IV., the presence of a substantial number of worked-stone objects in stratas A and B in these areas is sufficiently explained; it will be safer to rely on the data given by areas I. and V., where 96 per cent. of the objects come from strata C and D. I think, therefore, that the industry had ceased to be carried on when the iron-working started.

Whether the stone industry continued till then is uncertain. In areas I. and V. the number of objects from stratum D much exceeds the number from stratum C, but the numbers are relatively small. Much larger numbers exist in area IV., where we know from slag evidence that the disturbance made by the furnace affected stratum D only slightly. The large number of objects in stratum C in this area can best be explained by the assumption that the industry continued into the period of formation of this stratum, but whether up to the time when the iron industry began must remain doubtful. On the pottery evidence it is unlikely.

Dr Grahame Clark has been good enough to make a detailed examination of the worked stone, and I attach his report at Appendix I. He has also made drawings of the most interesting specimens, and these are reproduced in fig. 1. The industry gave no evidence of date and was an exceedingly poor one, a fact perhaps sufficiently explained by the inadequacy of the raw material available. Flint is only obtainable in the Hebrides in the form of bench pebbles, and the cherts used were probably similarly obtained. Quartz was pressed into service and even bloodstone, a substance which does not seem to be elsewhere on record as providing material for implements. Since this must have come from the island of Rum, ten miles to the south of Rudh' an Dunain, its presence is evidence of at least coastal navigation. Rum is not known to have been inhabited before the Middle Ages,¹ and we have therefore no reason to believe that the bloodstone was obtained by trading.

¹ No pre-medieval structures and no surface finds are recorded in the Inventory of Rum in Roy, *Com. Hist. Mon. (Scot.), The Outer Hebrides, Skye, and the Small Isles*.

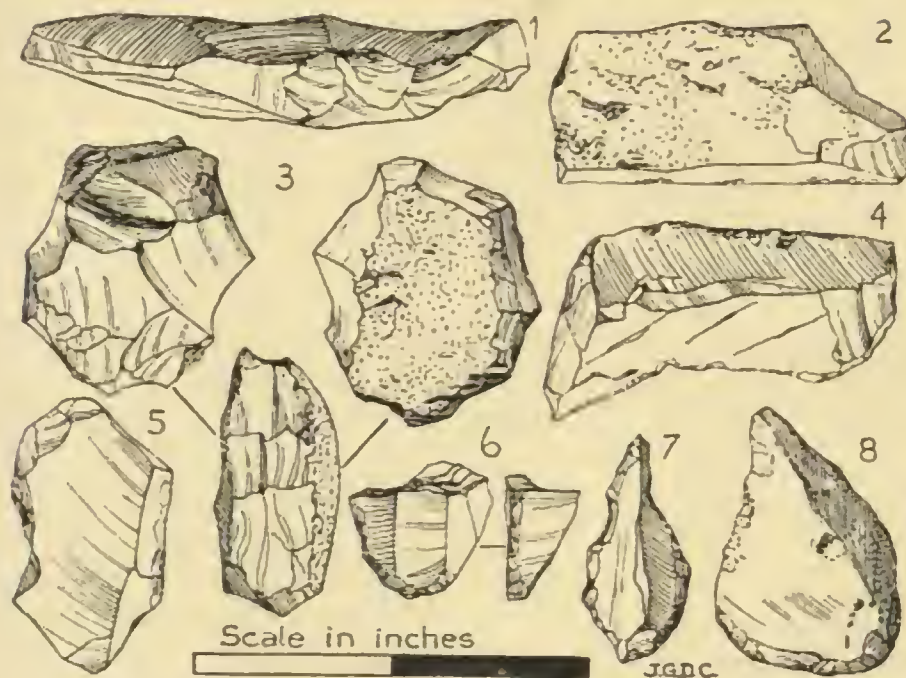


Fig. 1. Worked stone Objects. (1.) Nos. 1, 2, and 4 of Bloodstone; Nos. 3, 6, and 8 of Flint; No. 5 of Chert; No. 7 of Quartz.



Fig. 2. Iron Furnace from the north-east.

IRON-SMELTING INDUSTRY.

The stones now remaining of those which composed the smelting furnace are shown in plan and section in Pls. III. and IV., and photographs are reproduced in figs. 2 and 3. One vertical slab (L), and one horizontal slab (M) set at its foot, form the back of the furnace; the side walls are represented by blocks set on edge (N and P), which do not reach



Fig. 3. Iron Furnace from the south-east.

fully up to the back of the furnace; between these two stones a smaller block (Q) fills up most of the front. Smaller blocks lay on the south end of M and the east end of P. The furnace is set in the soft peaty earth, cutting through stratum C; the upper surface of M is in the plane of separation of strata B and C, and this, no doubt, represented the approximate level of the floor at the time the furnace was constructed. The space between these five stones measured 15 inches from front to back and 9 inches in width: it was unpaved.

In this space was found a mass of slug, and slag was also piled up

round the furnace, the greatest quantity being on the north side. The distribution of this slag was as follows:—

Distribution of Slag by Weight in Ounces.

Strata.		Areas.					All Areas.	
		I.	II.	III.	IV.	V.	Total Weight.	Percentage.
		oz.	oz.	oz.	oz.	oz.	oz.	
A		2	3	...	...	...	5	1.9%
B		...	17	4	176	Trace	197	73.3%
C		...	2	6	55	...	63	23.4%
D		Trace	1	...	3	Trace	4	1.4%
All Strata.	Total Weight.	2	23	10	234	Trace	269	100%
	Percentage.	.7%	8.6%	3.7%	87.0%	...	100%	...

In each of the regions I.D, V.B, and V.D, where "Trace" is recorded in the above table, one minute piece of slag was found weighing a fraction of an ounce.

Dr H. H. Thomas has been kind enough to examine the slag, and reports that it is "iron slag of the typical magnetite-fayalite variety." In addition to the great quantity of this dark slag a very small quantity of another slag, paler in colour, was found in I.D, II.A, II.B, and III.B. Regarding this, Dr Thomas reports as follows:—"This seems to be a glass-furnace product. A section was cut from a piece from II.B, and it shows a turbid glass full of small yellow prisms of a monoclinic pyroxene, with clear patches occupied by spherules and crystal-groups of the colourless lime silicate pseudowollastonite." This slag, he tells me, could be produced if sand were fused with lime, *e.g.* if a limestone slab were used as a wall to the furnace and the packing of the structure were of sand. Limestone is available at least as near as Strathaird, eight miles by sea from Rudh' an Dunain.

ANIMAL BONES.

A number of animal bones were found, most of them fragmentary, and Dr Wilfrid Jackson has been good enough to examine them. Their distribution was as follows (where no description is given the fragments were not capable of identification):—

EXCAVATION OF RUDH' AN DUNAIN CAVE, SKYE. 209

Distribution of Animal Bones and Fragments of Bone.

Strata.	Areas.				
	I.	II.	III.	IV.	V.
A	2	11 ? sheep.	20 of small sheep, not adult, including skull, lower jaw, and scapula. 1 lower molar of small ox.	...	
B	...	5 of sheep of small breed, including 1 tooth. 18 others.	2, including 1 calcined bone.	1	1 skull fragment, ? sheep.
C	4	1 scapula of sheep. 3 rabbit bones. 4 others.	2 sheep. 4 others.	1 lower molar of sheep. 1 lower premolar of small ox.	1 vertebra of codfish.
D	2 teeth of ox. 9 others (calcined).	1 skull of field vole. 1 femur of rabbit. 3 others.	...	1 vertebra of sheep. 6 others.	2 (calcined).

The sheep bones in stratum A represent, no doubt, a natural fatality, and the same may be true of the bones in stratum B, except the calcined one in area III. The rabbit bones in II.C and II.D have already been discussed and the field vole's skull in II.D requires no explanation. The calcined but unidentifiable fragments in stratum D, areas I. and V.—regions which it has been argued above were relatively undisturbed—may be assumed to represent bones dropped by the pre-Iron Age users of the cave. The codfish vertebra in V.C has in all probability a similar origin. The other bones in strata C and D may be brought

by man, but may equally be natural casualties at some stage when the cave was not in occupation. I fear, therefore, that the conclusions to be drawn from the bones found are meagre. The water-logged peaty soil of the cave had no doubt dissolved the great part of the bones originally deposited.

Sea-shells were found in considerable quantity at all depths and only specimens were kept. The shellfish represented were the common limpet, the common periwinkle, and the purple dog-whelk. Dr Jackson notes that a shell of the latter from II. B was broken as if to extract the dye. While the presence of sea-shells might be due to natural causes, an easily accessible cave away from the sea and affording no protection for nesting is not a place where the larger birds are likely to be found. It is fair to suppose that the shells represent the refuse of successive human occupants' meals.

WOOD AND CHARCOAL.

A few fragments of wood were found preserved in the peaty soil. Charcoal was present in quantity in the neighbourhood of the furnace and isolated fragments were found throughout the excavations. I am indebted to the Regius Keeper of the Royal Botanic Garden, Edinburgh, and to Mr M. Y. Orr for identifying specimens from a number of regions. These identifications are given in the following table:—

Distribution of Wood (W) and Charcoal (C).

Strata.	Areas.				
	I.	II.	III.	IV.	V.
A	...	(W) Pine. (C) Willow or Poplar.	...	..	...
B	...	(C) Birch.	(W) Hawthorn.	(C) Willow.	..
C	(C) Oak.	(W) Pine.	...	(C) Birch.	...
D	..	(W & C) Pine. (C) Willow or Poplar.	...	...	(C) Birch.

Mr Orr comments: "All the trees mentioned are native in the island of Skye, although the pine is said to be only doubtfully so by Druce in his *Comital Flora of the British Isles*. The advanced state of carbonisation of A II. (charcoal) and D II. (charcoal) make it impossible to distinguish between willow and poplar."

It is to be noted that quantities of driftwood are thrown up in Camas a'Mhurain, half a mile from the cave. This provides the only modern source of timber, the nearest trees, mainly birch and alder, being two miles to the east. No doubt ancient woods have been destroyed by the growth of peat, but it is probable that the ancient as well as the more recent inhabitants of Rudh' an Dunain collected driftwood from the shore. I am afraid, therefore, that the table given above, even if extended to include a much greater number of specimens, would not give any reliable index to the successive flora of the peninsula.

DESCRIPTION OF ARTIFACTS.¹

Pottery.—(1) Beaker (figs. 4 and 5). Three rim fragments (two from I.D and one, contiguous with one of the latter, from II.D) of a beaker of A/C type. The vessel has had an almost straight neck sloping slightly outwards; at $1\frac{1}{2}$ inch below the rim it begins to bulge outwards. The thickness is $\frac{1}{4}$ inch but decreases at the rim, which is rounded and slightly bevelled internally. The clay is fine, mixed with small crushed stone grits, and is dark grey internally and on the inner surface; the outer surface is buff, verging in places into dark grey. The decoration is impressed with a moderately fine comb.

(2) Beaker (fig. 5). Fragments from I.D of paste and thickness similar to (1) and probably part of the same vessel.

(3) Beaker (fig. 5). Fragment from I.D of paste and thickness similar to (1); possibly part of the belly of the same vessel. In addition to the comb decoration, and partly destroying it, there are lines of horizontal stabs made with a fine point.

(4) Beaker (fig. 5). Four fragments from V.C of paste similar to (1) and of $\frac{3}{8}$ to $\frac{1}{4}$ inch thickness. In addition to comb decoration there are lines of horizontal stabs similar to those on (3), partly destroying the comb decoration.

(5) ? Food-vessel (figs. 4 and 6). Five fragments (three from I.D, one from IV. D, and one from I.B) of a vessel which should probably be classed as a food-vessel. The one rim fragment shows that the rim was thickened and bevelled internally, the diameter being about 5 inches. The wall fragments show a slight curve in profile. The

¹ The vessels represented are numbered 1 to 15 in the description below, and are similarly numbered in figs. 4 to 7.

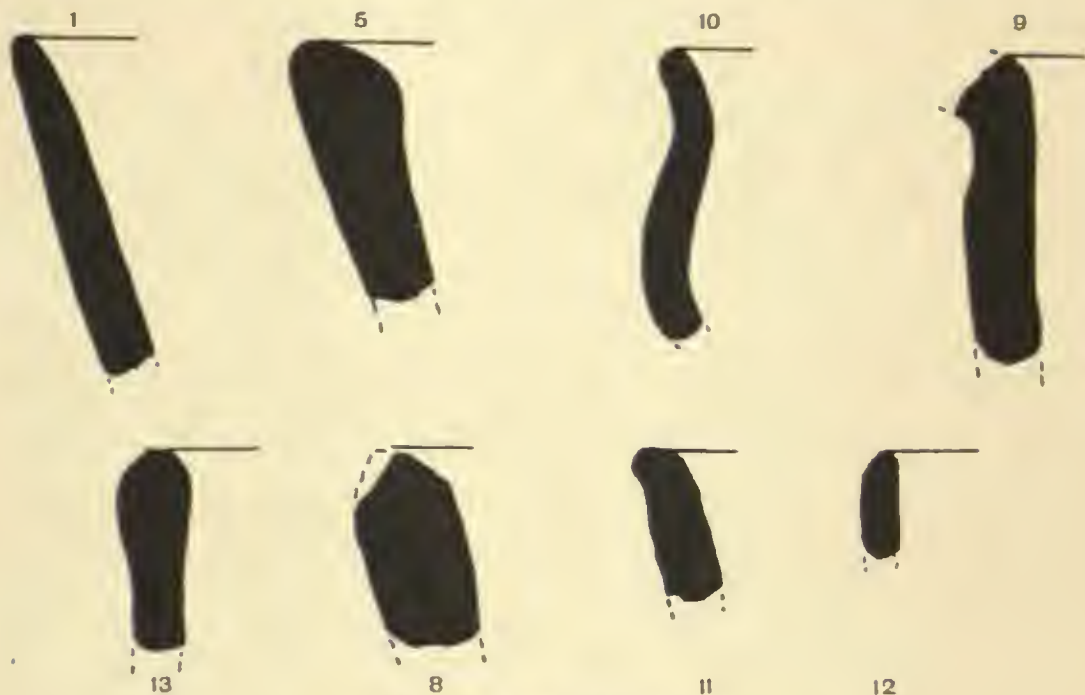


Fig. 4. Thin Sections of Pottery. (4.)



Fig. 5. Fragments of Beaker Pottery. (4.)

thickness of the vessel below the rim is $\frac{3}{4}$ inch. The clay is moderately fine, mixed with fairly small crushed stone grits; the surfaces, except where now disintegrated, are smooth. The pottery is black throughout, though the exterior surface in one fragment verges in places to brown. The decoration is mainly impressed with a very coarse comb, the pattern being erratically formed of horizontal and diagonal lines, possibly forming chevrons in places. There are, however, finely scratched horizontal lines below the rim and signs of more deeply incised vertical lines elsewhere. The internal bevel of the rim is decorated with diagonal comb-impressed lines.

(6) ? Food-vessel (fig. 6). Fragments from IV. C of vessel decorated similarly to (5) and of the same thickness. The clay is generally like that of (5), but the surfaces are less smooth and the colour throughout is buff. It is just possible that it is part of the same vessel; it is certainly decorated with the same comb.

(7) ? Beaker Period Vessel (fig. 6). Fragment from V. C of vessel $\frac{5}{16}$ inch thick of moderately fine clay mixed with coarse crushed quartz grits, dark grey internally and on inner surface, reddish buff on outer surface. It is decorated with regularly spaced tube impressions, $\frac{1}{8}$ inch in diameter, pressed into the clay at right angles.

(8) ? Early Bronze Age Vessel (fig. 4). Small and damaged fragment of a thickened and internally bevelled rim from V. D. The clay is fairly coarse with moderately large crushed stone grits, dark grey internally and on inner surface, buff on outer surface.

(9) Early Iron Age Vessel (figs. 4 and 7). Damaged rim fragment from V. C, and body fragment from II. B of a vessel with a slightly hollowed neck and a rim roughly turned over to the exterior and flattened. The thickness is $\frac{5}{16}$ inch. The clay is fine and sandy in texture, the grit remaining is fine, but there have been large grits which have dissolved and left pits in the surface. The interior is brown to grey and the inner and outer surfaces brick red to dark brown.

(10) Early Iron Age Vessel (figs. 4 and 7). Fragment from I. B of a slightly hollowed neck irregularly made with everted rim plainly rounded over. The thickness varies from $\frac{5}{16}$ to $\frac{1}{4}$ of an inch. The clay is fine with a few large grits, and pock marks representing grits which have dissolved. It is red buff internally, and the inner and outer surfaces vary from a reddish to a greyish buff.

(11) Early Iron Age Vessel (figs. 4 and 7). Small fragment from II. C of a rim flattened on the top and pressed outwards. The thickness below the rim is $\frac{5}{16}$ inch. The clay is fine with few grits; the interior is grey, the inner surface grey buff and the outer one red buff.

(12) Early Iron Age Vessel (figs. 4 and 7). Small fragments from



Fig. 6. Pottery of Beaker Period. (1.)



Fig. 7. Early Iron Age and Sandhill Type Pottery.

II. B of an upright rim simply rounded over. The thickness is $\frac{3}{8}$ of an inch. The clay is fine with few grits; the interior is a dull brick red; the inner and outer surfaces are brick red to grey.

(13) ? Early Iron Age Vessel (figs. 4 and 7). Small fragment from II. A of a thickened and rounded rim. The thickness below the rim is $\frac{1}{8}$ inch. The paste is coarse, mixed with much grit; the interior and the inner and outer surfaces are yellowish buff.

(14) Sandhill Type Vessel (fig. 7). Fragment from V. A of a vessel of a coarse sandy texture, $\frac{3}{8}$ to $\frac{1}{2}$ inch thick, dark grey internally, grey buff to dark grey on inner surface, reddish buff on outer surface. There is a shallow groove, 1 inch long, made with the finger-tip on the outer surface.

(15) Sandhill Type Vessel (fig. 7). Fragment II. A of the carination of a vessel of fairly fine clay, pinkish grey internally and on the inner surface, and pink on the outer surface. The thickness at the carination is $\frac{3}{8}$ inch; above and below it is $\frac{1}{4}$ inch. A herring-bone pattern is incised horizontally, straddling the carination.

Daub.—Two small fragments of clay burned brick red were found in I. C. From a rounded groove through one and fine grooves on the surface of both they seem likely to have been part of a wattle and daub structure.

Wood.—The implement of pine wood, 1 foot 6 inches long by $5\frac{1}{2}$ inches wide by $\frac{3}{4}$ inch thick, illustrated at fig. 8, was found lying on its edge at a distance of 6 inches from, and parallel to, the inner (eastern) side of the furnace. Its upper edge was level with the upper surface of the east wall of the furnace. One corner has rotted away and part of its surface, but it has otherwise been completely preserved in the peaty soil. From its position it is reasonable to connect it with the iron industry, but its condition gives no indication of its use. Its surface is unburned and has no trace of adhering metal, though no doubt any metallic iron would have disappeared long since by oxidisation.

Pumice.—Two lumps of pumice were found in I. D. The larger has a facet considerably ground away by rubbing some flat surface. The smaller has also a ground facet, though this is not quite flat.

Flint Pebble.—A silicious pebble found in I. D has approximately flat facets, and also a number of irregular, smooth hollows of various sizes. No convincing explanation in terms of human agency presents itself and the shape of the stone may be due to natural causes.

COMMENTS.

Pottery.—(The several vessels are referred to by the numbers used on the preceding pages and in figs. 4 to 7.) The study of the pottery is of special importance, since it provides the only means of dating the

sequence of occupations of the cave. The earliest certainly datable sherds are the beaker fragments (1) to (4). As these are all of fine thin ware with typical comb decoration arranged in horizontal bands, one fragment showing a plain band, there is no reason to regard the vessel or vessels as late. Some sherds have stab in addition to comb decoration. This type of decoration is not recorded by Abercromby, but in the Cambridge Museum of Archaeology there is a fragment, dredged with Peterborough sherds out of the River Wissey, on which this motive is used, and in a manner closely similar to its use at Rudh' an Dunain. Stab decoration is found on some Scottish Windmill Hill pottery, notably at Ustan in the Orkneys, and is exemplified in the Hebrides at Eilean an Tighe, North Uist;¹ it is also found on Peterborough ware.² Its presence on beakers at Rudh' an Dunain and in Cambridgeshire may therefore be interpreted as a reminiscence of a local neolithic tradition.³

It may be noted that here the stab decoration has been made after the comb impressions and that in places it interferes with them. It has been pointed out by Rosenberg that cord-ornamented pottery stretching from the Black Sea to the Baltic and from the Baltic to Britain often has an additional decoration in the shape of a line of pits below the rim, and that in Europe, but not in Britain, these pits frequently interfere with the cord ornament.⁴ He has argued that this phenomenon proves a superimposition of two traditions. At Rudh' an Dunain the motive derived from the earlier culture is the intrusive one, and appears to represent a harking back by beaker makers of neolithic stock to their old native tradition. There is evidence from burial practice that beaker people were absorbed in the Hebrides into the neolithic population without break in the cultural tradition.⁵

The vessel numbered (5) appears to approach the food-vessel more closely than it does any other recognised type. The thickened rim with a decorated internal bevel is typical of the food-vessel, and comb decoration is not rare on this class of pottery in Scotland. It has been argued that the food-vessel in its most characteristic forms (vessels

¹ J. G. Callander, *Proc. Soc. Ant. Scot.*, vol. lxiii, pp. 93 and 94.

² Stuart Piggott, *Arch. Journ.*, vol. lxxxviii, p. 116. Mr Piggott suggests that its presence at Ustan is to be explained by Peterborough influence. The point cannot be argued here, but I personally regard this as an element in a group of decorative motives, mainly geometric, which distinguish a type of Orkney and Hebridean pottery deriving from a source other than English neolithic wares.

³ Some caution is desirable, however, about the Cambridgeshire specimen. There seems some reason to think that certain beakers of apparently composite decorative tradition from this area derive in fact directly from a Netherlands type.

⁴ G. Rosenberg, *Kulturströmungen in Europa zur Steinzeit*, p. 101.

⁵ *Proc. Soc. Ant. Scot.*, lxi, p. 207. For similar evidence regarding Anglesey, see *Arch. Camb.* (December 1933), p. 223.

with hollow shoulder-grooves bridged by lugs, footed bowls and shallow bowls decorated on their round bottoms) represents traditions derived, possibly through Ireland, from Sardinia, Pyrenean France, and Portugal,¹ and the vessel here in question may represent the impact of those traditions on the Hebridean neolithic culture. That the internal bevel, which is not characteristic of Windmill Hill pottery anywhere, did in fact impose itself on that ware in the Hebrides is shown by two vessels from the chambered tomb of Cletraval, North Uist;² of these one is pure West Highland Windmill Hill, while the other, found at a higher level, and stratified with fragments of beaker type, is almost identical with it, but shows a decorated, steep, internal bevel. The decoration of the vessel (5)—very coarse comb-impressed lines arranged diagonally and more or less at random—suggests Hebridean Windmill Hill ideas carried out with the new implement, the comb. It may fairly be inferred that the vessel represents local neolithic tradition under the impact of food-vessel influence, and therefore dates from food-vessel times. A virtually identical rim fragment, found in a pit dwelling at Mye Plantation, Wigtownshire, has, however, been provisionally classified by the excavator and by Dr Callander as neolithic.³ It may be noted, since food-vessels are still generally regarded as a purely funerary pottery type, that a fragment considered to be food-vessel, though possibly late beaker, was associated with Peterborough and beaker pottery in Rowbarrow Cavern, near Bristol.⁴

The fragment of vessel (7) shows a type of decoration consisting of equally spaced small circles impressed at right angles to the surface with a hollow tube. Identical decoration is found on a fragment from the divided ditch habitation site at Abingdon,⁵ which is classified as relatively late in the Windmill Hill series, and on a fragment from a hut-circle at Muirkirk, Ayrshire,⁶ where it was associated with beaker. Generally but not identically similar decoration is found on sherds from Glenluce and Hedderwick,⁷ on beakers from Wiltshire and Berkshire,⁸ and on an unpublished sherd, probably of a beaker, from High Wheeldon cave, near Buxton.⁹ The pottery referred to on p. 216 above,

¹ Cf. *Proc. International Prehistoric Congress*, 1932, pp. 133-4.

² I hope to make a report on this tomb in vol. lxi., of these *Proceedings*.

³ Ludovic Mann, *Proc. Soc. Ant. Scot.*, vol. xxxvii. p. 301, and J. G. Callander, *op. cit.* p. 55.

⁴ H. Taylor, *Proc. Spelæological Society*, 1925, p. 200. From the illustration given I should personally regard the description of the sherd as food-vessel as distinctly doubtful.

⁵ E. T. Leeds, *Ant. Journ.*, vol. viii. pl. lxi. fig. 25, and *Antiquity*, vol. iii. pl. ix.

⁶ A. Fairbairn, *Proc. Soc. Ant. Scot.*, vol. lxi. p. 272, and J. G. Callander, *op. cit.* p. 95.

⁷ J. G. Callander, *op. cit.* p. 90.

⁸ Abercromby, *Bronze Age Pottery*, vol. I. Nos. 3 and 7.

⁹ Information from Mr Stuart Piggott, to whom I am also indebted for calling my attention to the Abingdon parallel.

which was dredged from the River Wissey in the Fens and shows distinct interaction of Peterborough and beaker traditions, includes a sherd with impressed circles. This type of decoration appears, therefore, to be primarily a neolithic form, though it appears rarely on beakers.

The vessels mentioned above undoubtedly date the earliest use of the cave. No vessels of Windmill Hill type were found, and the first occupation may be taken to belong to the period when beakers were being introduced and the native neolithic pottery was being modified under their influence and that of food-vessels. All this group of vessels may be relatively early in the beaker period. The chambered tomb of Rudh' an Dunain, which was built in Windmill Hill times, was being used at that period for the burial of beaker-using people, one of them broad-headed, who may be assumed to have been the first users of the cave.

There is no pottery assignable with certainty to the period between the beakers and the Early Iron Age. A few fragments can plausibly be regarded as Bronze Age from their texture, and one minute and damaged rim fragment with an internal bevel (8) may be relatively early. From the paucity of the sherds which can even conjecturally be placed in that period it is probable that the cave was not then continuously in use.

Of the Early Iron Age pottery (9) to (13) it is not possible to speak in detail or with much confidence, since the sequence of Scottish wares of this period has not yet been studied with the same thoroughness as that of the corresponding English wares. Mr Christopher Hawkes, who has been good enough to examine the fragments, expresses the opinion that some of them definitely represent the Scottish analogue to English Iron Age A. The fort which overlies in part the chambered tomb in North Uist mentioned on p. 217 above has produced a number of sherds of well-defined type which give much clearer evidence of the existence of a Hebridean Iron Age A. When this culture reached the Hebrides and how long it flourished there we do not at present know. We can at least be sure that it has disappeared by the period of the broch and sandhill cultures with their entirely different pottery, and these begin, at any rate, in the Roman period.¹ The broch of Dun an Iardhard, Dunvegan, Skye, produced a terra-cotta object apparently representing a bale of merchandise;² the earth-house of Bac Mhic Connain, Vallay, North Uist, produced a Samian sherd.³ The Iron Age A culture of

¹ No sharp cleavage appears. Iron Age A pottery does appear in brochs, though it is not typical.

² F. T. Macleod, *Proc. Soc. Ant. Scot.*, vol. xlix, p. 266; and J. Curle, *Proc. Soc. Ant. Scot.*, vol. lxxv, p. 305.

³ E. Beveridge and J. G. Callander, *Proc. Soc. Ant. Scot.*, vol. lxxv, p. 61.

Rudh' an Dunain may be expected to have been displaced by the time that the promontory broch was built a short distance away from the cave which is the subject of this paper.

To the period of the promontory broch I would hesitantly assign the two sherds (14) and (15) from stratum A. The texture and the finger-tip decoration of the former strongly suggest sandhill-broch pottery. The incised chevron pattern on the latter might suggest the Bronze Age, but this attribution would not be supported by the texture and colour of the sherd. Chevron patterns occur on pottery from the broch of Dun an Iardhard, Skye¹ and from sandhill sites in Coll and Tiree,² and it is probably to this period that the fragment is to be assigned.

There was no trace of Romano-British pottery in the cave.

Iron-working.—The iron furnace may be assigned to the Iron Age A occupation of the cave, since its floor was, as already stated, in the plane of separation of strata B and C. Whatever the precise date of this occupation, the type of furnace may be taken to represent that in use by Iron Age A invaders of Britain, and this is of some importance, since no pre-Roman iron furnaces have hitherto been found either in Scotland or in England.³

It is reasonably clear that the Rudh' an Dunain furnace is of the primitive Western European type which has survived into modern times under the name of the Catalan forge. Charcoal and ore would be piled against the back wall and a blast from a skin bellows would be applied through a channel leading round the base of the back wall. The contents of the furnace would be gradually stirred together from the front and would agglomerate into a spongy mass. When the ore was sufficiently reduced the loose cinder would be raked away and the bloom of iron levered out. It would then be hammered into a compact mass and left to cool.⁴

An artificial blast is not essential to iron-smelting though it greatly accelerates the process. I do not think, however, that the operation would have been carried out in a cave if a natural draught had been used; there would have been too much back draught. How much the

¹ F. T. Macleod, *op. cit.* p. 67.

² E. Beveridge, *Coll and Tiree*.

³ British Museum, *Early Iron Age Guide*, 1925, p. 2. A curious furnace was found by Mr E. T. Leeds at Chinn Castle (near Land's End), which was an Iron Age B fortress, though it continued in some sort of occupation into Romano-British times. Iron and tin slag were found near the furnace, which Mr Leeds suggests "may have been used for smelting rather than cooking" (*Archæologia*, vol. lxxvi, pp. 216 and 217). From the size of the furnace (10 feet by 5 feet) and from the description given it seems unlikely that it can have been used for iron-smelting.

⁴ For a description of analogous processes, see Sir William Gowland, *Archæologia*, vol. lvi, p. 300 ff., and *J.R.A.I.*, vol. xlii, p. 276 ff.; see also *Ency. Brit.*, 9th ed., s.v. "Iron."

draught was improved by enclosing the fire we cannot now tell, but the presence of slag formed by the fusing of sand with limestone suggests that the sides were built up with slabs and packed outside with a covering of sand. The front might be similarly treated and broken down only when the smelting was nearly completed. No clay appears to have been used either to pack up the slabs of the furnace or to provide a nozzle for the air channel; the fragments of burnt clay mentioned on p. 215 above are more reasonably interpreted as part of a wattle and daub structure.

This furnace is much more primitive than the Early Iron Age furnaces in the form of a vertical shaft which are found on the Upper Danube and in the Jura,¹ and resembles in shape and size the copper-smelting furnaces found at Mitterberg in Austria.² These are square hearths built up at the back and sides, but open, or at least not permanently closed, at the front. They are built into the side of a hill, however, and the blast can hardly have been applied from the back, as it probably was at Rudh' an Dunain.

The latter is, of course, a much cruder affair than the Roman iron furnace recently found at Colsterworth in Lincolnshire,³ but it does not differ from it in principle. The Lincolnshire example was a box-shaped structure of clay set in the ground with a clay roof pierced with holes, and with holes in the side to admit the blast; it was fed from one end. On the other hand, Rudh' an Dunain is considerably more advanced than an iron furnace in Constantine's Cave, Fifeshire, which was associated with amphorae dated to the second century A.D.⁴ This furnace was no more than a flat hearth with a low kerb of stones round it, and the blast must have been fed in across the top. No simpler form of iron-working than this exists anywhere, yet its users must have been in trading relations with Romanised Britons south of the Antonine Wall.

The wooden implement described on p. 215 above and illustrated in fig. 8 may probably, from its position, have been used in connection with the iron-working. There are no parallels to it among the numerous wooden implements recovered at Mitterberg.⁵ So simple an article might be turned to many purposes, and would probably be used to shovel the ore and charcoal into the furnace and to pack the exterior of the walls with sand.

Pumice.—The pumice found with beaker fragments in I. D is of

¹ Sir William Gowland, *Archæologia*, vol. lvi. p. 315 ff.

² J. Andree, *Bergbau in der Vorzeit*, pp. 31 and 35; and in Ebert, *Reallexicon*, s.v. "Bergbau."

³ J. C. Hannah, *Ant. Journ.*, vol. xii. p. 262 ff.

⁴ A. J. B. Wace and Prof. Jehu, *Proc. Soc. Ant. Scot.*, vol. xlix. p. 211 ff.

⁵ J. Andree, *op. cit. supra*.

similar, probably West Indian, origin to that found in the beaker stratum of the chambered tomb,¹ and may well have been used by the same people. The use of pumice picked up from the shore can, however, be traced back to neolithic times in the Hebrides² and continued into Romano-British times, and probably later.

General.—The excavation of the cave was undertaken in the hope of throwing light on the domestic life of the Rudh' an Dunain peninsula during the two thousand years which separated its two great monuments, the chambered tomb and the promontory broch. Actually the use of the cave has been shown not to begin until the



Fig. 8. Wooden implement. (1 foot 6 inches in length.)

later stage of the employment of the tomb, when beakers had ousted Windmill Hill ware, and it has been shown virtually to have ended by the time the broch was built. Within these extreme limits the excavations have served to illustrate the occupations, if not the domestic life, of the inhabitants of this isolated area. At the beginning of the period they were carrying on a stone-knapping industry, which carried them as far as Rùm in the search for raw material. At the end of the period they were engaged in iron-smelting, and were the possessors of a furnace which, primitive as it is, is considerably more advanced than one in use in Fife in the Roman period by people who traded with Romanised Britons.

The stone-working began with beaker-using people, who, on the evidence of the tomb, included broad-headed invaders who mixed with the native population. There is no conclusive reason for thinking that the use of the cave was continuous, and, so far as the evidence of the cave goes, the peninsula may have experienced no Bronze Age. The iron-workers were the bringers of a new culture analogous to that of the English Iron Age A. We do not know whether the iron-

¹ See Dr H. H. Thomas's report at App. II. to my paper on the tomb in *Proc. Soc. Ant. Scot.*, vol. lxvi. p. 212.

² A piece was found in a neolithic stratum in the chambered tomb in North Uist mentioned on p. 217 above.

smelters worked their metal up themselves or whether they traded it by sea; there are no iron implements as evidence of the former and no obviously traded objects to show the latter. The North Uist fort mentioned on p. 218 above shows that the Hebrides had a quite vigorous Iron Age A culture of their own, and Rudh' an Dhuin had some share in this. No doubt, however, this period was not comparable with the abundant activity of the succeeding one, which gave to the peninsula its magnificently built promontory broch. But by this time the use of the cave had virtually ceased.

I should like in conclusion to express my gratitude to Dr J. Grahame Clark of Peterhouse, Cambridge, for his report on the stone industry and for his drawings of the implements; to Dr H. H. Thomas of the Geological Survey for his work upon the slag; to Dr J. Wilfrid Jackson of Manchester University for his examination of the animal bones; to the Regius Keeper and Mr M. Y. Orr of the Royal Botanic Gardens, Edinburgh, for the identification of the wood and charcoal; and finally to Dr H. J. Plenderleith of the British Museum for his most successful preservative treatment of the wooden implement.

APPENDIX I.

REPORT ON THE WORKED-STONE INDUSTRY.

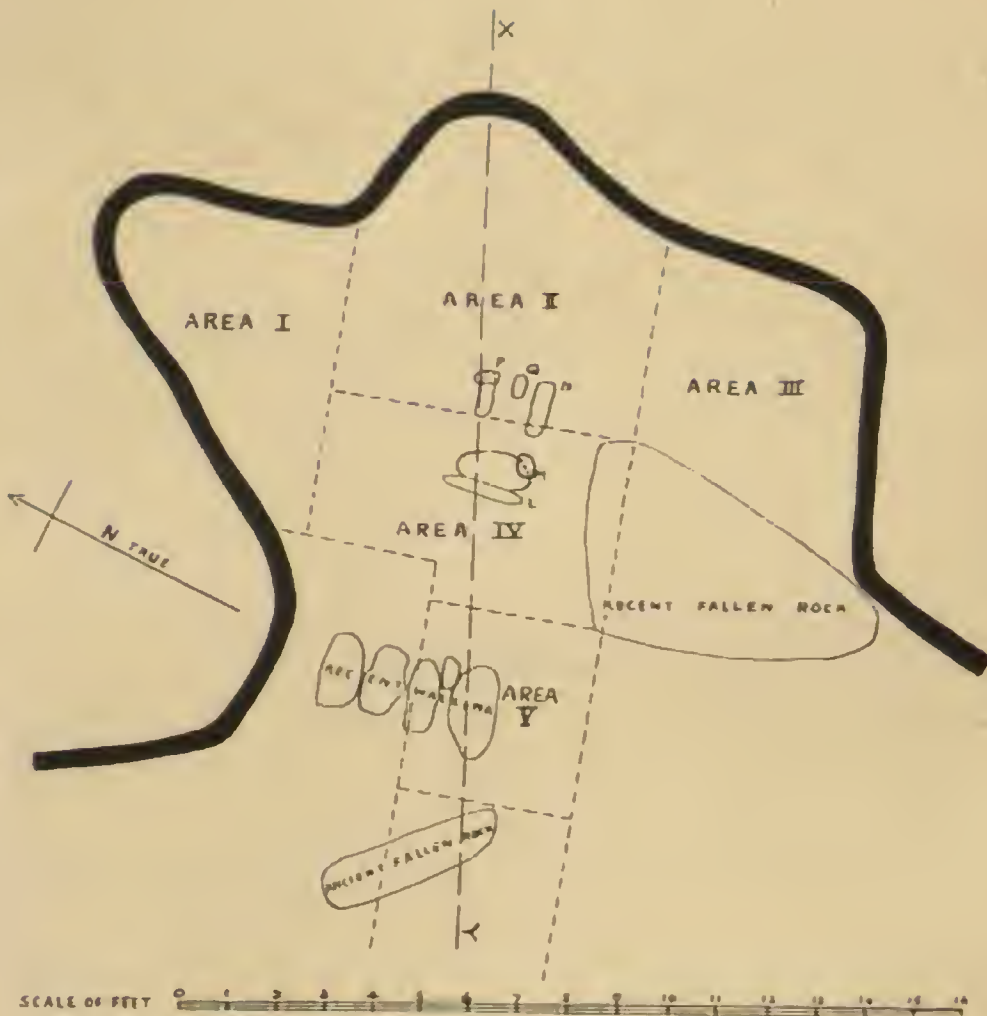
By J. G. D. CLARK, Ph.D., M.A., F.S.A.

The raw material shows considerable diversity, consisting of various kinds of flint and chert,¹ quartz and bloodstone. The flints and chert seem to derive from the beach much of the flint showing traces of pebbled cortex (e.g. Nos. 3 and 8). The bloodstone is of some interest as it seems to indicate a certain amount of local trade, or at least contact. We may quote Mr A. G. Brighton of the Sedgwick Museum, Cambridge, who kindly submitted specimens to Mr Harker: "The greenish specimens with red-brown spots are undoubtedly bloodstone, and Mr Harker, to whom I have submitted them, is quite certain that they must have come from 'Bloodstone Hill' (Creag nan Stairdean) in Rùm."²

Typologically the industry is too poor to be culturally informative. The great bulk of the material consists of waste chips and rather formless cores. Some quite good flakes were, however, obtained from

¹ Thus in addition to flint of normal appearance there is a considerable amount of black material patinated a yellowish grey colour, which Dr Thomas of the Geological Survey regards as "either flint or chert from the Mesozoic deposits." Another variety is dark red, and this Dr Thomas regards as "chert possibly from pebbles out of the Triassic conglomerates." All could be obtained locally from the beaches in Dr Thomas's view.

² Vide also Harker, 1908, *Mem. Geol. Survey, Scotland, Geology of the Small Islands in Inverness-shire*, p. 134.



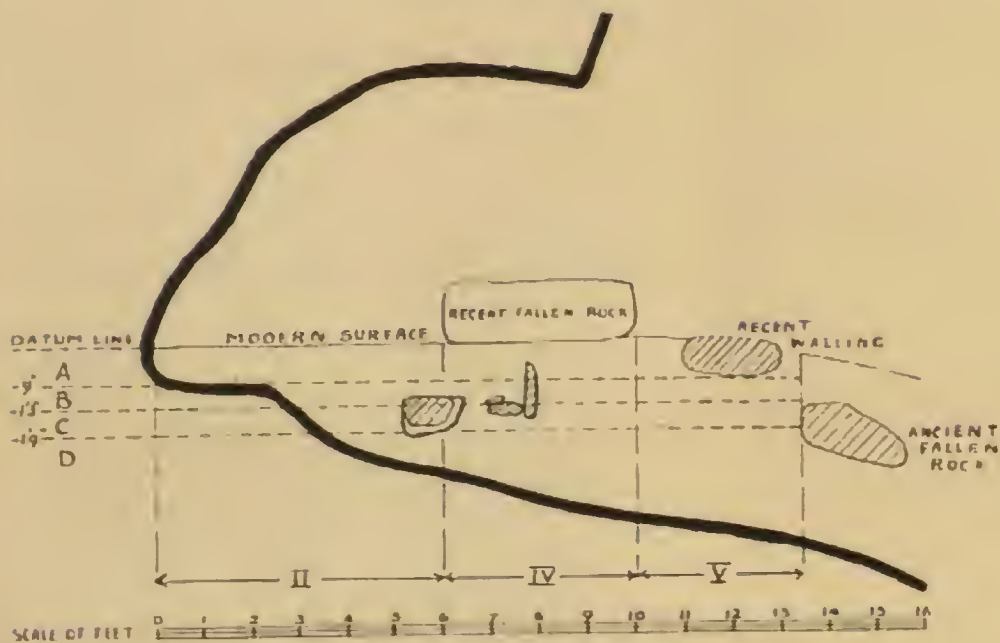
Plan of Ruidh' an Duinain Cave.

W. LINDSAY SCOTT.

PLATE III.

[To face page 122]

SECTION ALONG XY



Section of Budd'an Dunain Cave.

W. LINDSAY SCOTT.

PLATE IV.



the bloodstone, e.g. No. 1 (from IV. D), a flake of triangular section with a partially battered keel, and Nos. 2 and 4 (from I. A), both of which show signs of use for cutting or sawing. It is interesting to note that No. 2 shows a narrow band of very faint lustre of the type produced by sawing into some hard object.¹ No. 3 (from III. B) is a shaped lump of flint with pebbled cortex; if regarded as a core one can only say that the flakes struck from it cannot have been of much use owing to their small size. A few poor scrapers occur (Nos. 5 to 8 from II. D, V. C, II. B, II. B respectively). No. 6 of flint must have been difficult to use with much effect. It is possible that Nos. 7 and 8, especially the former, which is of quartz, were hafted in some kind of handle. The pointed part of No. 7 shows no signs of use as a borer and may be regarded as a tang. A flake of red chert has been trimmed round the edge from both faces. It is broken and is of no special form.

Seventy-five per cent. of the worked-stone fragments came from layers C and D, which yielded beaker sherds, while the remainder came from layers A and B, with Early Iron Age sherds. There is no noticeable difference between the specimens from the two horizons. It should be noted that the cave has been subject to some disturbance.

¹ This lustre may only be seen in the right light. On flint it is very easy to see. Possibly the material explains this difference.

III.

AN ACCOUNT OF FURTHER EXCAVATION AT JARLSHOF, SUMBURGH, SHETLAND, IN 1932 AND 1933, ON BEHALF OF H.M. OFFICE OF WORKS. BY ALEX. O. CURLE, C.V.O., F.S.A.Scot., F.S.A.

In the *Proceedings* of the Society, vol. lxvii., for session 1932-3, a report was published on the completed excavation of a dwelling which was designated Dwelling No. i, but the report and consideration of the excavation of an adjacent dwelling, commenced in 1932 and designated No. ii, was left over until it in its turn would have been completed, as was anticipated, in the summer of last year.

In 1931, when exploring the secondary entrance into chamber D of Dwelling No. i, there was located an earlier wall passing beneath it, and on following up this clue in the summer of 1932 the remains of Dwelling No. ii were discovered lying to the eastward, and practically contiguous. When the sand and soil had been removed over an area measuring some 22 feet by 25 feet it was apparent that the remains, which lay at a level of 15.25 feet above Ordnance Datum, were very fragmentary, and as the greatest dilapidation had occurred towards the west and adjacent to Dwelling No. i, it seemed probable that the material had been utilised for that building.

The plan as revealed in 1932 did not show the full extent of the original structure, and accordingly at the commencement of last season's exploration a considerable area was uncovered to the eastward in the hope that additional remains, and in better preservation, would be revealed. In this we were grievously disappointed, for on the surface exposed practically no structure remained. Such stones as were revealed were merely lying on the surface with no suggestion of construction.

The plan, as far as recovered, showed a building differing somewhat from that of Dwelling No. i, but disclosing certain features in common. Though it revealed two periods of construction, the condition of the soil on the floor, and the relics from it, indicated that neither occupation had been of long duration. The original structure, represented almost entirely by a segment of wall towards the south-west, had apparently been circular. This wall was 2 feet in thickness, and built throughout without clay. The entrance through it from the south-west was 2 feet 6 inches wide, and had extended inwards for a distance of some 4 feet, being flanked on either side, apparently, by built piers, probably

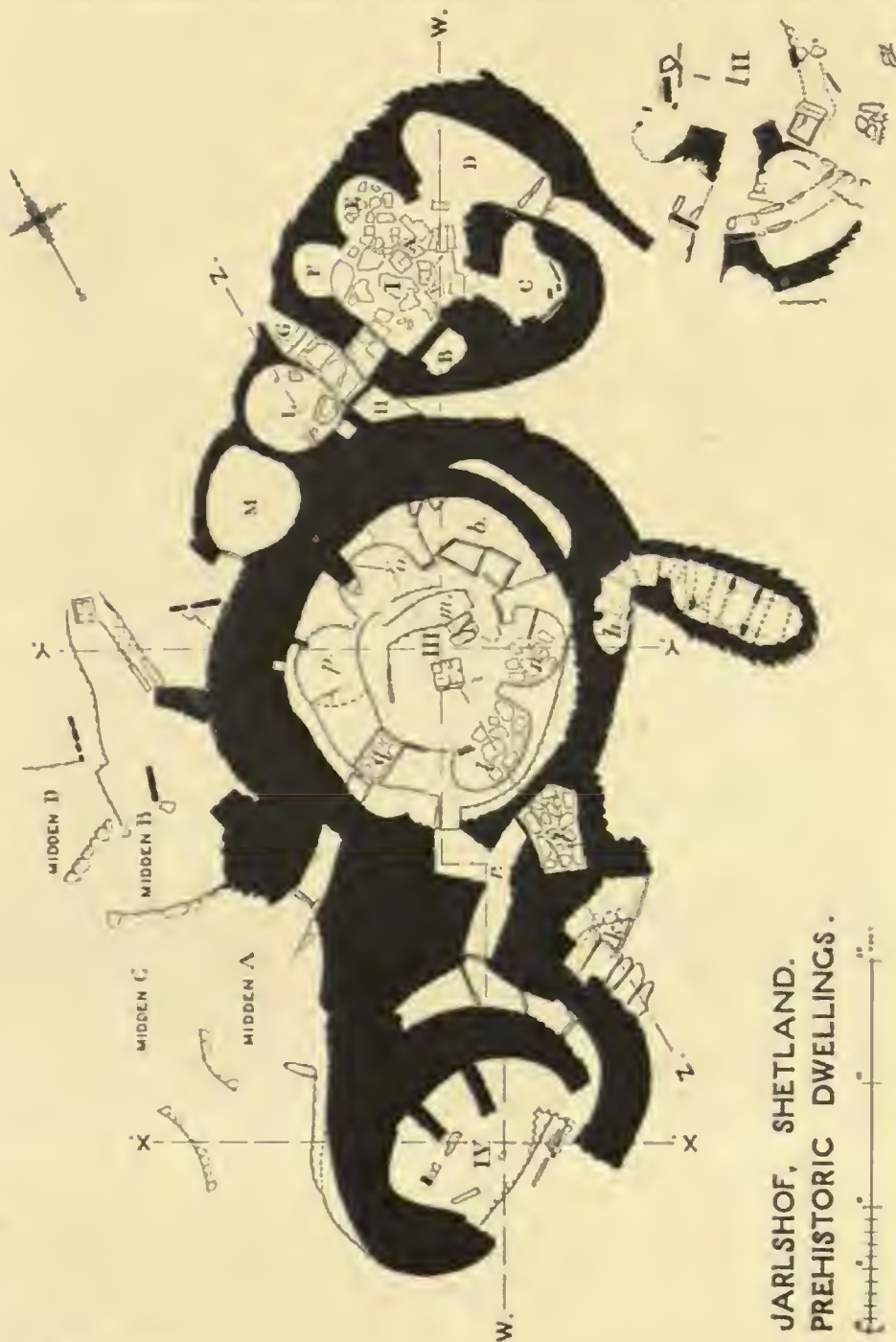


Fig. 1. Plan of excavations as far as completed at the close of season 1934, prepared by H.M. Office of Works, Edinburgh.

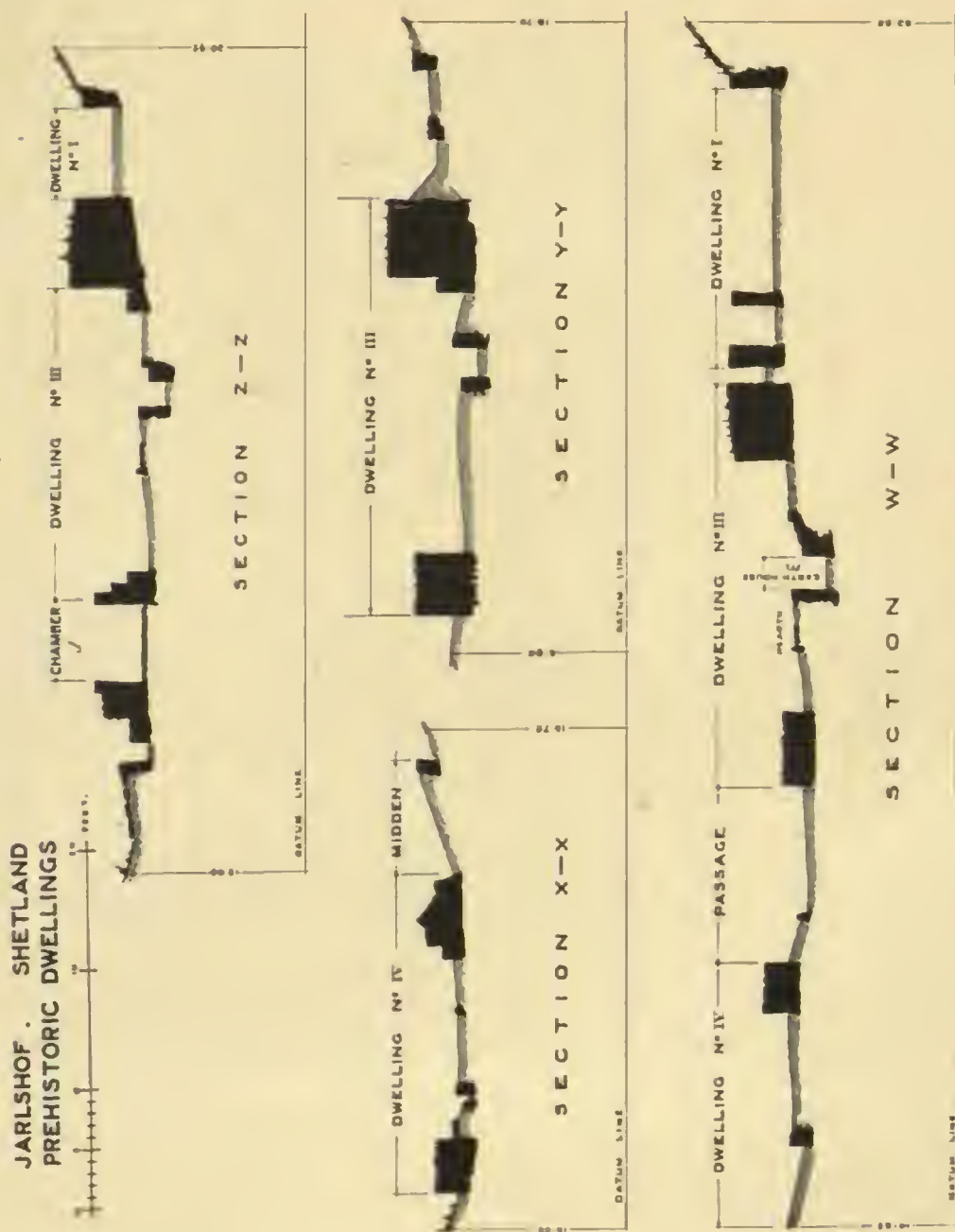


Fig. 1a. Sections relative to Plan, Fig. 1.

forming the ends of chambers. The floor of the passage consisted of sandy clay burned to a brick red. In what had probably been the centre of the dwelling was a large hearth, on two sides of which were kerbstones, indicating a rectangular enclosure. The original bed of this hearth had, like the floor of the passage, been formed of sandy clay burned to a brick red, while in the secondary occupation it had been paved.

The later construction, as will be seen from the plan (fig. 1), consisted



Fig. 2. View across Dwelling No. II, showing the back Wall of Dwelling No. I on the right. The arrows indicate the positions of the Slate Boxes.

of an inner enclosure which had apparently followed a plan very similar to that of its predecessor, with divisional walls terminating in upright slabs springing from an outer wall of circumference 2 feet wide, formed largely of upright stones set on the outer and inner circumferences, with loose rubble between. The secondary character of the later wall was borne out by the fact that the upright stones forming the termination of the earlier wall, at right angles to the passage, were set in yellow clay placed there after their beds had been cut out of the red burnt floor. In general the work of the later builders was distinguished from that of their predecessors by the lavish use of yellow clay. The plan of the interior is very ill-defined, but there is an indication of an arrangement of large upright stones around the

hearth set at the apices of triangular blocks of masonry, which probably rested on the surrounding wall, and contained cells or chambers between them, as was seen in Dwelling No. i (fig. 2).



0 1 2 inches

Fig. 3. Sherd of Pottery found in Slate Box.

the purpose of keeping it plastic.

On the opposite side of the hearth was another slate box, pentagonal in form, and measuring 2 feet in longest diameter by 1 foot 10 inches, by 1 foot 5 inches in depth. It was floored with yellow clay, and luted in the angles with similar material, while clay, which covered the outer faces, would, if desired, have rendered it water-tight. It was filled with debris, among which were a few shells of cockle and limpet. Sticking in one of the angles near the top was a sherd of coarse pottery (fig. 3) decorated with a zone of repeating chevrons between two impressed lines. A cleaver of slate, with a handle, measuring 10½ inches in length, was also found projecting from a break in one of the side slabs.

Slate artefacts, chiefly of a spatulate form, were of frequent occurrence on the floor of this dwelling, and as on the surface of one of these a lump of yellow clay was found adhering, it is suggested that such implements may have been employed for working with clay after the manner of the mason's trowel.

On the south-east half of the enclosure, adjacent to one of the piers, is situated a slate box, or tank, formed of large slates, measuring 2 feet 7 inches by 2 feet 2 inches, by 2 feet 6 inches deep, and partially covered at one end by another slate. Yellow clay lay on the floor of the tank and was present in the corners, while externally there were indications that the construction was set upon a bed of clay. At one end, towards the north-west, lay a deep irregular mass of this material, and lesser deposits lay in the vicinity, indicating that the tank had evidently been used to contain clay for



0 1 2 inches

Fig. 4. Knife-like object of Bone.

Very little pottery and few animal bones were found on the site, and though no querns came to light one rubber was found. A knife-like object, 8 inches long, formed from the bone of an ox, was found below some debris (fig. 4). A midden, chiefly composed of shells, lay under the site towards the north-west at a depth of about $1\frac{1}{2}$ foot. A portion of this was examined and there was recovered a small fragment of a Shetland "knife" of polished obsidian, also a segment of a large vessel of stentite polished on both surfaces. A midden nearer the surface exposed on the north-west yielded a cylindrical bend of bone $1\frac{1}{4}$ inch in length by $\frac{1}{2}$ inch in diameter (fig. 31, No. 3).

In the course of the exploration of this site the stratum of blown sand which was found just above the foundation-level of Dwelling No. i, and passing across the front of the secondary entrance, was observed to be lying equally distributed over the whole of the area, the base of it at a height of $2\frac{1}{2}$ feet above the hearth-level with dark soil beneath, indicated that a long period of time must have elapsed between the abandonment of Dwelling No. ii and the period of construction and occupation of Dwelling No. i.

In removing the superincumbent material last summer with a view to reaching the floor-level of No. ii, at a depth of 3 feet below the surface, and at a height of 10 inches above the stratum of blown sand, an object of particular interest was recovered (fig. 5). This was a disc of fine-grained sandstone measuring 2.2 inches in diameter by $\frac{1}{2}$ inch in thickness, having incised on one face two of the symbols so frequently associated with early Christian monuments in the north-east of Scotland—those known as the "spectacle" and "flowering rod" symbols. The surfaces of the rim and of the reverse face are very smoothly polished. The symbols vary slightly from the usual representations in that the centre portion of the rod is placed at right angles to the two floriated ends and the discs are unornamented. The edge of the stone, on the upper or decorated face, is considerably chipped.

A disc of similar dimensions and character, bearing a design formed by a divergent spiral, was found in the course of the previous excavations carried out by the proprietor, and is illustrated in the *Proceedings*,

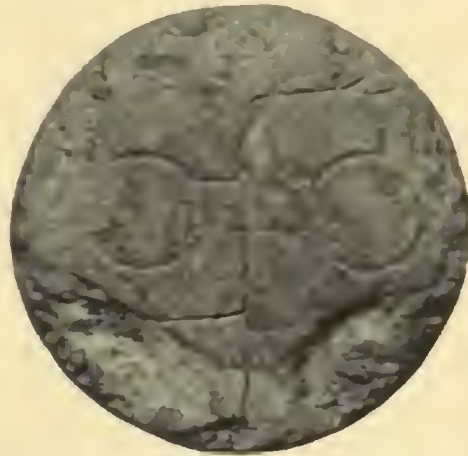


Fig. 5. Stone Disc ornamented with "Spectacle" and "Flowering Rod" Symbols. (1.)

vol. xli. p. 33, while another, not yet illustrated, bearing a somewhat indeterminate pattern, was also found while the broch and adjacent buildings at Jarlshof were being cleared up by H.M. Office of Works in 1925. Two other ornamented discs found on the Ness of Burgi at the end of the promontory of Skatness are illustrated in the *Proceedings*, vol. xvii. pp. 296 and 297.¹ Numerous discs of similar character and dimensions, but unornamented, have been found during the course of excavations around the site. One of these found in Mr Bruce's excavation is likewise clipped on the edge of one surface, and indentations on that surface suggest the possibility of some decoration having been chiselled off.

DWELLING No. III.

Before proceeding to describe the excavation carried to completion on this dwelling in the summers of 1932 and 1933 it is desirable to refer again to the site of Jarlshof and to relate the indications of its early history revealed in the course of our exploration. The geographical position, a low promontory in a comparatively sheltered bay at the extreme southern end of Shetland, is such that, in early times, before regular trading-centres were established or safe anchorages discovered, almost every adventurer who had dared the passage from the south would land there, or in the neighbourhood. Therefore it is not surprising to find that at almost whatever level of occupation the excavation reaches there is an earlier one beneath in the character of a kitchen-midden. As related, such a midden lay below the remains of the earliest dwelling, No. ii. It was found beneath the earliest level in No. i, and it was met with last summer while searching for the outer wall of No. iii. No pottery has so far been recovered from this midden-level, so we cannot attribute it to any particular period of culture. But between the occupation represented by the kitchen-midden, and that accepted as the first period of Dwelling No. iii, there was another important occupation with numerous stone buildings very similar in character of construction to those that came after, and yielding pottery not found in the later level within Dwelling No. iii. This occupation presumably came to a sudden end with the advent of the builders of Dwelling No. iii, as the similarity of the floor-levels indicate a close connection in point of time.

The excavation of this site was commenced in the season of 1932 and was completed last summer, when there was also explored the ground to the south and west of it.

In attaining to the level treated as primary and shown as the ground-

¹ I am indebted to Mr Carrie of the Ancient Monuments Commission for calling my attention to the latter reference.

level on the plan and sections (figs. 1 and 1a), two, and possibly three levels of occupation were passed through, the second and later revealing occupations of a less permanent character. It has been deemed best, therefore, to commence this communication with an account of the principal period in the history of the dwelling, and to deal with its subsequent phases in chronological order.

The lowest level uncovered showed the remains of the first of the occupations above referred to with a fairly complete plan. Though this was not the earliest occupation of the site, as disturbed soil lay beneath its floor containing near the entrance a large saddle quern, it was deemed advisable to regard this level as primary and leave the structural remains undisturbed, as there was no evidence to show that any building connected with the still earlier occupation remained beneath. It was evident that this building was not the earliest not only by the disturbed soil below, but by the character of the remains to the south-west of it, to be hereafter described. The portion of an outer wall occurring in the periphery on the north-east probably also belonged to a previous construction on the site. This was exposed in 1932 at the inner end of cell H in Dwelling No. i, and was built with a very decided batter, thus differing from any other walling observed in the building. Its base lay 13.93 feet above Ordnance Datum, which is slightly lower than that of such other parts of the outer wall as are measurable.

Dwelling No. iii is approximately circular, measuring in the interior some 22 feet by 26 feet, with the longer axis from west to east. The outer wall, where such exists, is badly defined and of different periods. In certain directions apparently there had been no outer wall. Following the wall in a south-easterly direction for a length of some 15 feet from the early fragment above mentioned, it is noticeable that it is not in alignment, that it is formed of different material not all uniform, and that its foundation lies some 4 to 5 inches higher than that of the early portion. Along the south-eastern section for a length of 15 feet it is again of a different character, being distinguished on that part by a considerable use of upright stones in its construction and in its foundation. The next portion extending to about a quadrant of the circle is occupied, in the first place, by an area of ruins and reconstructions, against which the inner wall of the dwelling must have rested. Beyond that, forming the south-west quadrant, the inner wall appears to be revetted against a structureless mass of debris, containing among the stones, numerous fragments of pottery and other relics, evidently derived from the earlier occupation. On a section running from west to north, the periphery is merely marked by a row of large boulders resting on soil at a high level. The explanation appears to be that when the

builders of Dwelling No. iii arrived they found an existing settlement stretching seaward. This they completely overwhelmed, erected their own habitation on the site, and subsequently spread into previously unoccupied ground to the northward, as exemplified by Dwelling No. i.

The primary inner wall of Dwelling No. iii, formed of selected flat beach stones and built without pinnings, though much reduced in height, is still approximately complete. It shows a plan which conforms some-



Fig. 6. View of primary occupation level of Dwelling No. iii towards original entrance.

what closely to that of Dwelling No. i as far as excavated in 1931, that is to the eastward of the entrance passage G of the latter. Access has been by a passage *q* from the west, now of unascertainable length, but possibly some 10 feet long and 2 feet 6 inches wide, into a courtyard measuring 13 feet 9 inches or thereby in diameter, out of which there opened rounded chambers, two to right (*l* and *n* of plan) measuring respectively 8 feet 3 inches by 4 feet 3 inches, and 6 feet 3 inches by 5 feet, and two to left (*p* and *o*), *p* being incomplete and unmeasurable, while *o* measures 12 feet by 9 feet, with a larger chamber *b* at the back facing the entrance (fig. 6). Slightly to the south of the centre of the courtyard was a paved hearth, measuring 2 feet 6 inches square, with a single kerbstone rising at the south-west side, much reddened by the

action of fire, the surface of the hearth being at a level of 13'81 feet above Ordnance Datum. To the south-east of the hearth, and in alignment with the back of it, was an area, ill-defined, as it had evidently been disturbed in the formation of the earth-house *m*, to be described hereafter, and slightly sunk, now measuring some 12 by 14 inches. On the west and north sides of this area against the soil were some lumps of yellow clay, such as might have been used to maintain small upright slabs in position, and spread evenly over the floor, to a thickness of a $\frac{1}{4}$ to $\frac{1}{2}$ inch, was a thin bed of the same material. On this lay horizontally much carbonised wood to a depth of $\frac{1}{4}$ to $\frac{1}{2}$ inch, among which were one or two pieces of an unused sword mould. The natural condition of the clay showed that no burning had taken place on the spot. Specimens of the charcoal were removed for examination, and as it has now been ascertained that they represent various varieties of timber—oak, Scots pine, hazel, willow, and poplar or birch—it seems likely that there was here a store of charcoal to be used in the process of smelting.¹ To the north-west of the hearth a group of stones thrust vertically into the ground marked the position of a post-hole probably of the second level, beneath which was much carbonised wood disintegrated, evidently the remains of a post some 8 inches in diameter.

To either side of the entrance passage at its inner end, there seems to have been a pier of masonry, measuring some 4 to 6 feet across, separating it from the first of the lateral chambers on either side. The chambers *l* to *p* shown on the plan have been built into the wall, and are separated by radial piers faced with upright slabs, in exactly the same manner as in Dwelling No. i, and in the buildings adjacent to the neighbouring broch, and of subsequent date. The pier on the north-east side of chamber *n* terminates with a projection towards the south-west, and in rear of it a slab set on edge against the wall forms a recess about 1 foot 9 inches wide and a little over 1 foot deep. A single stone projected at right angles from the corner nearest the entrance of chamber *l*, behind which lay a collection of ten stone implements (fig. 7) varying from 7½ inches to 1 foot in length, and lying in orderly arrangement, which seemed to indicate that here also there had been a recess or ambry. Scattered over the floor of this chamber were some thirty implements of slate or stone, and in the east end a barrow-load of cobble-stones, pebbles from the beach, round and oval, such as could be easily held in the hollow of the hand. The entrance passage was flagged, as also were the floors of *l* and *n* (fig. 8). The floor of *p*, on the other hand,

¹ I am much indebted to Mr M. Y. Orr of the Royal Botanic Garden for examining and reporting on this charcoal.

was formed of yellow clay, while that of *a* was covered with a thin layer of yellow peat ash, and had been much disturbed. The floor of *b* was the natural sand, and it is noteworthy that the floor of the chamber occupying a similar position in Dwelling No. i was also unpaved.

The history of chamber *b* is very obscure. Occupying the opening into it, between the two piers, there are sunk in the floor two slate boxes in alignment, formed with slabs on each side and end, and with a single septal slab between them (fig. 9). They measured respectively 2 feet



Fig. 7. Collection of Stone Implements found together in Chamber *b*. (4.)

3 inches by 2 feet, by 1 foot 4 inches deep, and 2 feet 5 inches by 2 feet, by 1 foot deep, and were almost entirely filled with sand and food refuse, chiefly animal bones. From these boxes were recovered two pieces of a clay mould for a sword, unused, and the pouring gate for a similar mould almost complete, illustrated on p. 282, fig. 49. As these practically closed the entrance they can only have been placed there subsequent to the abandonment of the chamber. Originally the chamber had a breadth of 12 feet 6 inches, and a depth from front to back of 9 feet 6 inches, but subsequently a reducing wall was constructed diminishing the size of the chamber to 11 feet 6 inches by 6 feet. The general character of the material used in this wall differs from that in the other chambers, in that the stones are larger—

nor is the building quite so neat. Its position, however, and the level of its foundation, point to it having been constructed during the early period of occupation.

Fig. 10 shows the northern half of the dwelling, chambers *o* and *p*, with the later building at the back of them.

The relics found on the floor of this early occupation were numerous,



Fig. 8. Chambers *l* and *n* showing paved floor of the former.

and will be particularly detailed hereafter. They included various pieces of clay moulds, used and unused, for casting swords; saw-edged objects of slate; implements of stone of the Shetland type; and chisels of bone fashioned with a socket in the process-end after the form of the bone tools from the Maglemos in Denmark. The pottery was, for the most part, straight-sided with simple rims, burned brick red, and made without steatite in the body. Scrapers of quartz were of frequent occurrence, and from the floor of *p* came seven large cores of quartz, weighing in all from 20 to 30 lbs.

At the close of this occupation a considerable period seems to have elapsed during which the building fell into ruins, as the next occupants of the site disregarded for the most part the plan of their predecessors. When they entered into possession they reduced the walls around the chambers to a general height of about 18 inches, abandoned the entrance, laid a sill across it at the new level, restricted it in breadth and made it the approach to a large midden (Midden A) to the westward. A new



Fig. 10. Slate Boxes in Floor of Chamber *b*.

entrance was formed (*r* on plan) towards the south-west, passing over an existing wall in which there had originally been an opening subsequently blocked by three flagstones set parallel in the direction of the wall. On the right or north-west side a wall had been constructed against the mass of debris which occurred at this place, with a short return to the southward, where this secondary passage led into a passage belonging to the pre-existing settlement, to be dealt with later on (fig. 11). The original entrance passage *q* was at its inner end levelled up with paving flags to the height of the inserted sill. A new inner wall was erected above and behind the face of the earlier wall, as may be seen in fig. 6. With this occupation the building appears to have been converted from a dwelling-house to a workshop. A large hearth was

constructed in the centre of the courtyard with a slab set upright at the south side to act as a fireback. This, when found, was lying displaced. To the north-west of the hearth had been the post-hole mentioned above, and at three different places on the north and east sides of the hearth pebbles were noticed placed upright in the ground as if marking the sites of other post-holes. Conceivably this was the



Fig. 10. The northern half of the Dwelling Chamber o and p, with later Walls above.

remains of some arrangement for erecting a screen of hides to shelter the fire. Beside the hearth was found in that position—an inverted quern. The south-eastern are over the sites of chambers *l* and *n* appears to have been abandoned as no structural remains of other chambers were found there, while on the opposite side large slabs set on end were employed for the main portion of walls erected to form small cubicle-like chambers above *p* and *o* (fig. 12).

Enclosing the hearth on two sides, north-east and north, an underground chamber (*m* on plan) had been formed during this occupation, but its condition indicated that it had not been long in use. It had been entered from the vicinity of the exit to the Midden A, and from

the outer end of the existing remains extended inwards for a distance of 13 feet 9 inches. The floor-level at its commencement lay 13.93 feet above Ordnance Datum, and descending by steps it fell to 10.99 feet. From a width of 1 foot 3 inches at the opening it expanded at a distance of 5 feet 6 inches to a width of 2 feet 6 inches, where an intake on the left probably formed the check of a door. Thereafter, turning to the right the actual chamber was formed, expanding to 2 feet 6 inches



Fig. 11. Entrance of Second Occupation with Passage Wall on right.

at its greatest width, and narrowing to a point at its termination. At the inner end a shallow recess on the right extended southward to a depth of 2 feet 6 inches. The walls were constructed of coursed masonry, rather small thin stones being used, as shown in fig. 13. When discovered only the terminal cover remained in position over the main chamber, and three over the short southward projection. On the former three covers were lying displaced, while all the others had been removed. The facts that the end covers actually rose above the floor-level of the earliest hearth, and that the wall on the north-west closed the front of the early chamber *p* indicated clearly the secondary character of this construction. There was hardly any discoloration on the sand

which formed the floor to show that the chamber had been occupied, and there were very few animal bones, and no other relics with the exception of a small worked fragment of bone found upon it. In clearing out the sand, however, which filled the chamber, several relics were found at various depths. At a depth of 2 feet 6 inches beneath



Fig. 12. Remains of orthostatic Construction of Second Occupation over Chamber *p*.

the remaining lintel a small bronze pendant consisting of an oblong plate with one end turned over to form a loop was found (fig. 42, No. 1), also fragments of the rims of two pots with finger-mark impressions on the top (fig. 54, Nos. 8 and 9). From the next further sherds of the last-mentioned ware were recovered, and, *inter alia*, a piece of the outer envelope of a mould.

The discovery of this souterrain raises the question of the use of a small chamber found in 1932. This construction was situated above the original entrance (*q* on plan) exactly in line with the commencement, as remaining, of the souterrain. It consisted of a small quadrangular

chamber formed of flags, measuring 3 feet 2 inches long by 2 feet 4 inches wide, and was entered by an opening 1 foot square.

This opening, if of its original dimensions, seems too restricted for human use, diminutive though such entrances frequently are.¹

The peat that was used at this period gave a brilliant coloured ash in contradistinction to the yellow ash yielded by the fuel of the subsequent period, and was spread to a depth of many inches over the



Fig. 13, Earth-house *m* in right foreground.

whole floor of the central court. Numerous relics were found, including awls, chisels, and kindred objects of bone, also fragments of clay moulds. Sherds of pottery were recovered having a well-defined hollow beneath the rim, and it is noteworthy that no pottery of this class was found in the adjacent Dwelling No. i excavated in 1932. The most notable find which could be attributed to this level of occupation was the section of a completed mould, which had evidently not been used, for casting a bronze sword, described on p. 281, and illustrated in fig. 48.

The third occupation of this site followed fairly closely at a higher level the plan of its predecessor. The dwelling continued probably to be used as a workshop. A large circular hearth (fig. 14), measuring 5 feet 6 inches by 4 feet 6 inches, was constructed in the centre, formed

¹ See Hencken, *Cornwall and Scilly (passim)*.

with a bed of gravel 4 inches deep covered with clay, backed with a large slab set up on end with a narrower one flanking it, and outlined with stones. The peat consumed on it, which had accumulated to a depth of 1 foot 8 inches, almost to the top of the fire-back, produced a buff-coloured ash, and was spread over the whole area. Cubicle-like chambers were constructed along the west and north arcs, the area occupied by



Fig. 14. Third Occupation-level showing Central Hearth.

p and *o* on the ground plan and the masonry between them being covered with three of these chambers *c*, *e*, and *f* (fig. 15). The walls were roughly constructed, as in the level immediately below, with upright slabs and horizontal building. Though a hearth was found in each, except in the case of *f*, the most westerly, it is doubtful if they were used as dwelling-places. Chamber *f* differed somewhat from the other chambers of this period, being formed between the inner face of the main wall and a solid four-sided block of masonry measuring some 4 feet 6 inches by 3 feet 9 inches. The purpose of such a heavy pier of masonry at this

place is not explained by any existing remains. At the inner end of *f*, at that point some 2 feet wide, there was a hearth, and in the face of the main wall a well-constructed ambry, measuring 1 foot 2 inches by 1 foot 5 inches, by 1 foot 2 inches deep, formed with slabs. Within this were found the two lower jaw bones of a pig and other bones.

In the central area, to the south of the large slab forming a fire-back.



Fig. 15. Third Occupation-level. Chambers *c*, *e*, and *f* on the Northern Arc.

was discovered a curious construction formed of flagstones set on end in shape of a triangle, and lining a hollow measuring 4 feet 3 inches in length, and 2 feet 3 inches across at greatest width. The flags probably rested originally on a paved floor represented by a mere scarcement. Beneath this level the soil was burnt to a brick-red colour, suggesting the use of the construction as a furnace, or possibly a kiln. Towards the north-east there had probably been an inner section, as the hollow extended in that direction, with the soil burnt on the floor of it to a like colour; but only one slab remained, and that placed obliquely on the

west side (fig. 16). From the south-west angle an air duct or flue passed through an opening, measuring 16 inches by 14 inches, seaward for a distance of 6 feet, covered with heavy lintels, two and three above one another, beyond which it was entirely broken down. This flue occupied the upper portion of the entrance passage utilised during the second period. It measured, as far as ascertainable, 12 inches by 10 inches.



Fig. 16. Triangular Construction to the South of the Hearth in the Third Occupation-level.

Some calcined animal bones and ash, bright red from burning, were found on the floor.

Querns and rubbing-stones were found in two of the chambers and in the central area, lying inverted. No grain was seen anywhere in the building, and as traces of clay were found on the surface of one of these querns, and of one found later on in a midden, it is probable that they were used for levigating clay in connection with the manufacture of pottery as well as for grinding grain.

The wall on the northern arc towards the interior, against which chambers *c* and *e* were formed, had been reconstructed at a late date with material which differed from that used in the adjacent wall of *f*, and appears to be merely a facing wall against an earlier construction behind. Much yellow clay had been used as mortar between the stones, as can be seen in fig. 17. It is noteworthy that in a partition projecting



Fig. 17. Section of Wall of Chamber *e* showing use of Clay Mortar.

from this wall to divide chambers *c* and *e* a number of small, flat, unbroken pebbles have been used as pinnings, differing in this respect from such pinnings used in brochs, which are invariably broken pieces of stone. This is the only part of the building in which pinnings have been used.

When this third occupation occurred the encircling wall was built across the exit to the midden, the builders being evidently unaware of the gap in the wall beneath, with the result that a serious settlement took place. In fig. 13, p. 240, may be seen at base the original entrance; above the sill of the later exit to the midden; and higher up the settled wall.

No actual entrance into the construction referable to this occupation was discovered. The entrance and passage of the second occupation was closed and blocked with the flue from the furnace, as mentioned above, and it can only be surmised that the building being in use at this stage of its history merely as a workshop, the entrance to it was open and unprotected across the former wall-heads on the south-east.

During the period under consideration a souterrain was constructed on



Fig. 18. Remains of Wall in front of the Entrance to the Souterrain *h*.

the eastern arc with its entrance above chamber *n* of the first occupation (*h* on plan, fig. 1).

The existence of a chamber, still roofed, was ascertained in 1932, but as it was undesirable to break into it by destroying the structure, the excavation around was proceeded with in the expectation that a normal line of access would be met with. The roof formed of heavy flags laid transversely to the direction of the wall of the main dwelling was uncovered, and towards the interior a fragment of a wall was exposed on which rested one end of a flagstone, the other end of which had possibly extended to the roof (fig. 18). Behind this, beneath a heavy lintel just discernible at the end of the flagstone in the foregoing figure, was found a stone door in position with stone wedges inserted

at the sides. A flat slab, partially covering it at base, lay against it, while in front, supporting it, lay three large boulders, two below and one above, pressing against the door (fig. 19). As may be seen in the illustration, the stones in the wall to the left of the doorway are bedded in a mass of yellow clay, and the debris lying against this wall indicated that it had not originally been exposed. In all probability, therefore, a covered passage led to the door and terminated there. The facing wall of the



Fig. 19. Entrance to Souterrain A.

second period had been partially demolished, and an excavation made in the thickness of the wall behind for the formation of a stair, and to a considerable depth into the undisturbed soil beyond for the chamber. Fig. 20 shows in the centre, at the edge of the darker material, the line of the cutting made through the natural deposit of sand, and the subsequent filling of soil and stones above the roof of the earth-house.

As it was obviously undesirable to disturb the door, so closed when the last occupants departed, access was obtained through the roof, where the end cover had been previously displaced. A passage 2 feet 6 inches in width, and furnished with rude steps, led down for 7 feet, and then

turning sharply to the right gave access through a portal, formed by an intake on the right, to a chamber 11 feet long, 4 feet 6 inches wide, and 3 feet high. The walls were constructed with upright slabs surmounted by horizontal building, the whole covered with large flags supported partly on the wall-heads, and partly on upright pillars set in the floor, projecting at right angles from the side walls (fig. 21). The floor was the natural sand discoloured by occupation. On it were found a bucketful and a half of animal bones, mostly broken for extraction of the marrow,



Fig. 20. Showing line of Excavation through the Natural Soil in formation of the Earth-house.

a number of fragments of different pots, eighteen hammer-stones (pebbles abraded at one or both ends), and seventeen pebbles in their natural condition, such as were probably brought into the chamber for the purpose of fracturing the bones. The only objects of peculiar interest were five *astragali* of oxen (fig. 37)—four of which were pierced through transversely, the other having the perforation only through one wall—and a small specimen of iron slag from a bloomery.

From this third occupation-level of Dwelling No. iii there came pottery of varied character, including a polished black ware with a cavetto beneath the rim, and whorls for spinning not found in the earlier levels. But conspicuous by their absence were pieces of clay moulds,

scrapers of quartz, and artefacts of slate, so common in the earlier levels.

The evidence of the fourth occupation was slight, and confined chiefly to a rudely built wall over the latest peat-ash deposit across the front of *b* on the east side of the central court.

In carrying the exploration beyond Dwelling No. iii to the southward conditions were found to be greatly disturbed. The chamber *j* (see plan, fig. 1) immediately to the south of *l*, had evidently belonged to the period that preceded the construction of Dwelling No. iii, as the wall that separated



Fig. 21. View of Interior of Earth-house *b*. (The white support in the centre is not a part of the original construction.)

the chambers had obviously been constructed against the material with which *j* was filled. A passage, blocked up, had led into it from the west. The floor was paved and lay at a level 13.85 feet above Ordnance Datum and some 6 inches above that of *l*. That the filling of this chamber had been effected at an early period was evident from the relics found within it. Numerous pieces of moulds, and sherds of pottery (fragments of straight-sided vessels, with and without a head rim, and with no stentite in the body), comparable with pottery found elsewhere and referable to an early period, came from the blocked passage and the filling. To the south of *j* a triangular portion of the paved floor of a chamber, *k*, was exposed at 13.37 feet above Ordnance Datum, which, as well as an area to the west of it, had been covered with a layer of heavy flags, part

of some late structure. The pottery found in the lower part of this chamber indicated that its occupation had been contemporaneous with that of *j*.

From the blocked entrance to *j* a passage led in a west-south-westerly direction for a distance of 11 feet 6 inches, with a paved floor at level of 12.49 feet above Ordnance Datum. To the northward a



Fig. 22. The Main Passage showing Paving, Blocking above it and Flue on top.

branch in the second period had formed the access to the centre of Dwelling No. iii, having evidently served some previous purpose, as the actual entrance to Dwelling No. iii passed over the base of a wall 1 foot 6 inches above the floor-level of the passage, as previously mentioned. Along the line of this branch the flue from the furnace of the third occupation had been carried, passing over the top of large stones employed to block the main passage (fig. 22). Over the area on either side of the passage there is an accumulation of debris, with here and there a short length of walling, giving no clue to its original purpose.

At a distance of some 12 feet from its original end in *j*, the passage is blocked by a large flag set on edge, beyond which it bifurcates to left and right. The right corridor, also blocked at its commencement, terminated in the back portion of a small early chamber with the remains of a bee-hive roof. As shown in the illustration (fig. 23), this corridor is faced on the north side by a wall of later construction. The corridor



Fig. 23. The Right Corridor of the Passage showing facing Wall of later construction.

to the left, as may be seen on the plan (fig. 1), is also blocked at two points and at different levels. The level in front of the first block, 12.25 feet above Ordnance Datum, being apparently the original ground-level.

From a consideration of the levels and the finds it seems probable that the people who constructed Dwelling No. iii in its first period, overthrew, on their arrival, a settlement already existing on the site, and proceeded at once to construct on a part of it a fresh habitation for their own use. The area to the south-west of it, between Dwelling

No. iv and the middens to be afterwards described, is covered with many feet of debris.

This previous occupation does not appear to have extended as far as the ground occupied by Dwelling No. i, as there was no evidence on that site of a pre-existing building, and the plan of it, as well as the finds



Fig. 24. Cist-like arrangement of Slabs found above Dwelling No. iv.

recovered, present close analogies to those of Dwelling No. iii in its first period.

The continuous wall of both corridors to the south was the outer face of the wall of an incomplete building, referred to as Dwelling No. iv.

DWELLING NO. IV.

In clearing away the soil overlying Dwelling No. iv a cist-like arrangement formed of four upright slabs and a slab on the floor was uncovered, oriented east and west. It measured 19 inches and 20½ inches along each side, 15½ inches and 10½ inches across the ends, and 6 inches in depth.

It contained neither ashes nor remains of any sort, and its purpose accordingly remains undetermined (fig. 24).

In opening out the dwelling, when the wall was uncovered from beneath the masses of debris which overlay the whole area, it was evident that it had been subjected to various alterations. It had an average width of from 5 to 6 feet and took the form of a horse-shoe, open towards the south-east. Before reaching the floor-level shown on the



Fig. 25. Chamber above the Wall of Dwelling No. iv showing the opening from the West.

plan, a curious chamber formed of flags was uncovered (figs. 25 and 26) opening to the west. It was formed of flags set on edge and covered with slabs. An opening 10 inches square occurred near the top of the remains of the outer wall of the dwelling towards the west, behind which, dipping downwards, the chamber extended inwards for a length of 5 feet 3 inches, with an average breadth of 1 foot 4 inches, and height of from 12 to 18 inches. It was obviously late, and more resembled a dog-kennel than anything else, but there were no relics nor indications of its purpose found within it.

When Dwelling No. iv was uncovered to the floor-level it was found to consist of two small chambers separated by a radial pier of masonry,

while a similar pier cut off the most easterly chamber from ground on the east filled up in an earlier occupation (fig. 27). The soil beneath this floor-level was much disturbed, and there was no doubt that the remains of this dwelling belonged to a late occupation, but as they presented some analogy to the late structural remains of Dwelling No. iii which had been removed, it was considered desirable to leave them undisturbed.



Fig. 28. Chamber above the Wall of Dwelling No. iv from the East, with Roofing Flags removed.

The wall on the east had been sunk through a deep deposit of peat ash which lay also below it, and much peat ash was deposited over the floor. Possibly this dwelling in its later stages had also been used as a workshop, and the incomplete circle of its enclosing wall towards the south suggests a similar condition occurring as in Dwelling No. iii during its later period, no entrance being referable to that period, and no chambers erected on that area.

A study of the plan (fig. 1) indicates the amount of reconstruction

that has taken place on the site and in its immediate neighbourhood. The enclosing wall shows several lines of reconstruction towards the west, while across the front or south section are two walls, shown at the east side, facing in opposite directions and of different periods, both, however, of earlier date than the outer wall of the main building.

In a hole dug below the floor within the eastmost chamber the



Fig. 27. View of Dwelling No. iv as excavated.

soil was found to be black and greasy, and from it were recovered the end of a heavy stone club, pieces of two others, an awl of bone, and part of a slate saw. Just beneath the floor-level of the west chamber there was found the remains of a large pot crushed in the soil with the stone lid resting upon it.

The relics found in clearing Dwelling No. iv to floor-level included several awls of bone and scraper-like tools of the same material. Relics such as were recovered from the earlier periods of Dwellings No. i and No. iii were absent.

MIDDENS.

The area to the north of Dwelling No. iv, as far as explored, was almost entirely occupied by middens. Four of these that covered fairly determinable areas were designated Middens A, B, C, and D.

Midden A.—This midden was clearly referable to the earlier occupations of Dwelling No. iii, as it was placed at the end of the passage leading from the dwelling during these occupations, at a distance of 11 feet 6 inches from the inner end. Further, as the exit to it was closed in the later occupation its use had evidently been confined to the earlier period. The actual entrance to the midden during the second occupation was marked by a sill across the passage and a portal, while the outline towards the south and west was rudely defined by a loosely built wall in the former case, and large pointed stones merely laid on the surface in the latter.

It was some 2 to 3 feet deep, and contained large quantities of limpet-shells lying in blackened soil, and a certain number of animal bones, chiefly of oxen. Cockle-shells were rare, and only one fish bone was found. Chisels and pins of bone, pieces of sword moulds, a fragment of a crucible, and the usual stone axes and clubs of Shetland type were also found. In the bottom of the midden near its centre lay two broken querns, one of them of unusual size with a trough 9 inches in depth.

Midden B.—This midden lay immediately to the north of Midden A, from which it was separated by a line of boulders laid on the surface. Two upright stones on the north side, 3 feet apart, appeared to mark the entrance from some habitation in that direction. The material forming the midden was similar to that found in the others, and the relics recovered included pieces of clay moulds, quartz scrapers, stone axes, and clubs.

In addition to these, however, there was one find of peculiar interest, namely, the skeleton of a dog which had resembled in size a terrier (fig. 28). It lay directly in front of the assumed entrance, where its presence was fortunately revealed before disturbance by the chance exposure of a jaw. Its position was at a level of 16·93 feet above Ordnance Datum, and an examination of the sand and soil in the immediate environment showed clearly that it was upon a contemporary surface and that it was not a secondary interment. The posture of the skeleton suggested that the animal had lain down on its side naturally, with its limbs stretched out, and died in the midden where its remains were found. The bones were carefully cleared of soil, and after a measured drawing¹

¹ I was indebted to Mr James Richardson, the Inspector of Ancient Monuments, for making the measured drawing.

had been made and the skeleton photographed, it was dismembered and forwarded for examination to the Royal Scottish Museum.¹

Midden C.—This midden, whose limits were not clearly defined, lay beneath a bed of sand some 4 to 5 feet in depth, and to the west of Midden A. A very large quern lay on the edge of it, the rubber of which was found nearby. It produced as relics numerous heavy stone clubs, objects of bone, slate tools, quartz scrapers, and rims of pottery refer-



Fig. 28. Skeleton of Dog found in Midden B.

able to the earliest occupation of the site. The food remains were similar to those found elsewhere.

Between it and the seashore there are probably more midden deposits covered by a considerable depth of sand, and as this had had an unimpeded access to the area it was held to indicate the absence of any structural remains beneath.

Midden D covered an indefinite area to the north of Midden C, and produced relics of an early date. Upon it was uncovered the site of a quartz-knapper's operations. Alongside two anvil stones on which he had rested the cores of quartz while striking them, lay his hammer-stone indented with the blows, and lying around were the cores, chips, and two or three finished artefacts of quartz (fig. 29).

¹ A description of the skeleton is contained in a Report on the animal bones by Miss Margery I. Platt, M.Sc., forming an Appendix to this communication.

To the north-west of Dwelling No. iii, ground was uncovered on which sundry indefinite remains of structure were laid bare which may be explainable when further excavation has been carried out in this direction.

Before ceasing work for the season a commencement was made of clearing off the soil above the building discovered in 1932 at the north end of the original passage into Dwelling No. i. A considerable amount of the wall-head was exposed, showing that the building is in a fair state of preservation and not encumbered with ruins and debris.



Fig. 20. Site of a Quartz-Knapper's operations.

Just before leaving a series of exploratory pits were dug in the meadow to the northward of the fenced-in area, and structural remains, which seemed to be of prehistoric character, were revealed in a number of them.

The relics actually registered during the course of the season's work numbered over six hundred, while nearly one thousand were noted.

OBSERVATIONS ON THE RELICS.

ANVIL STONES.

Three anvil stones—pebbles with pitted depressions on the surface—were found in addition to the two that lay among the quartz-knapper's

material already referred to. One from chamber *n*, Dwelling No. iii, consisted of one-half of a flat round stone fractured across the centre. Another was a flat round stone, $3\frac{1}{2}$ inches in diameter, with the pittings on the flat surface, and was found outside Dwelling No. iv. The third was one-half of an oblong pebble with the depression along the upper surface, and was found in the corridor.

ARMLETS.

Nine segments of armlets of polished steatite or other material were recovered and are illustrated in fig. 30. They appear to have been

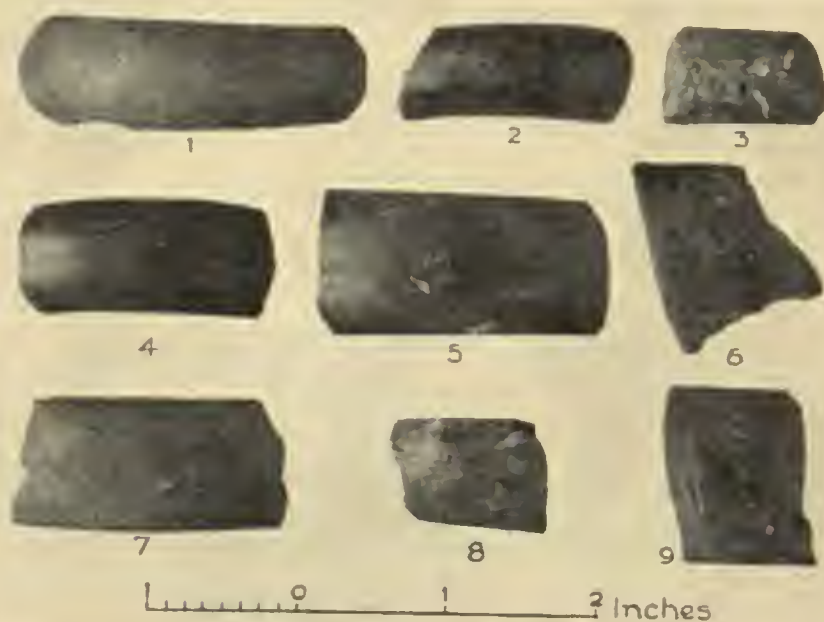


Fig. 30. Segments of Armlets.

of two types—broad and pointed oval in section, or comparatively narrow and only slightly convex on the inner surface. Of the former there were only two examples, both of dark green material, highly polished and measuring about $1\frac{1}{2}$ inch in breadth. They were referable to the third or latest occupation of Dwelling No. iii. The narrower specimens were of varying colour and quality of material, and measured about $\frac{7}{8}$ inch in breadth. They appeared to be referable to the second as well as to the third period of occupation.

No. 1 is a segment of grey-green steatite, $\frac{1\frac{1}{2}}$ inch broad; found in Dwelling No. iv.

No. 2 is a segment of dark green steatite, plano-convex in section, $\frac{1}{2}$ inch broad; found in opening out Dwelling No. iii at a level 18.25 above Ordnance Datum.

No. 3 is a segment of polished steatite, grey mottled black, $\frac{1}{2}$ inch broad and rather thin; found at the side of the earth-house *m* in Dwelling No. iii.

No. 4 is a segment of dark green steatite, slightly convex on the inner surface, $\frac{3}{4}$ inch broad; found in Dwelling No. iii at about level 15.53 above Ordnance Datum.

No. 5 is a segment of polished, mottled dark green steatite, $\frac{1}{2}$ inch broad; found at the level of latest occupation in chamber *d*, Dwelling No. iii.

No. 6 is a small segment of dark green material, highly polished on the exterior, pointed oval in section, measuring $1\frac{3}{16}$ inch in breadth but imperfect at one edge; found in clearing off surface soil south-west of Dwelling No. iii, at 18 inches below the surface.

No. 7 is a segment of grey coloured steatite, plano-convex in section, $1\frac{13}{16}$ inch broad; found at the same level as the last.

No. 8 is a segment of polished steatite of the same form as the last, $1\frac{11}{16}$ inch broad; found in clearing out earth-house *m*.

No. 9 is a segment of an armlet of dark green steatite, highly polished on the outer surface, measuring $1\frac{3}{16}$ inch in breadth, pointed oval in section; found to the west of the third occupation hearth in Dwelling No. iii.

BEADS OR PENDANTS.

Eight beads, or pendants, were found, fashioned from steatite or bone, six of the former material and two of the latter. All are illustrated in fig. 31.

A cylindrical bead of bone (fig. 31, No. 3) measuring $1\frac{1}{2}$ inch in length by $\frac{1}{2}$ inch in diameter was found in the portion of the shell midden examined to the north-west of Dwelling No. ii, lying below the floor-level of that site and consequently earlier than any of the other relics.

No. 4 shows the other bead or pendant of bone. It is an object, quadrangular in section, measuring $1\frac{1}{8}$ inch by $\frac{1}{4}$ inch by $\frac{1}{4}$ inch, pierced transversely towards one end. It was found in the earth-house *h*, and belongs, therefore, to the third occupation of Dwelling No. iii.

No. 5 is a bead, or possibly a pendant, of polished steatite, in form a flattened sphere, measuring $\frac{3}{4}$ inch in diameter and pierced from both surfaces, with a notch to one side as if the object had been suspended as a pendant. It was found in clearing out earth-house *m*, and so belongs to the second occupation of Dwelling No. iii.

No. 6 is an unpolished bead of steatite, $\frac{7}{8}$ inch in thickness, with a cylindrical perforation. It was found in the neighbourhood of Mid-den D.

No. 7 is an unpolished bead of steatite, roughly hexagonal, measuring $\frac{3}{4}$ inch in diameter, by from $\frac{3}{8}$ inch to $\frac{1}{2}$ inch in thickness. The perforation constructed in the centre is cup-like at either surface. It was found in soil fallen into the earth-house *m* from the second level.



Fig. 31. Beads of Bone and Steatite and part of a Ring of Steatite.

No. 8 is a small oblong bead of steatite, measuring $\frac{9}{16}$ inch by $\frac{1}{2}$ inch and from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch in thickness, with an oval perforation made from both sides, and slightly towards one end. It was found in Dwelling No. iv. An object of steatite (No. 1) similar to the foregoing, unperforated and probably an unfinished bead, was found in the entrance to earth-house *h*.

No. 9 is a discoid bead of steatite, measuring $\frac{11}{16}$ inch in diameter by $\frac{5}{16}$ inch in thickness. It was found to the south of the second occupation hearth in Dwelling No. iii.

No. 10 is a discoid bead, measuring $\frac{9}{16}$ inch in diameter and $\frac{1}{2}$ inch in thickness, with a small central perforation made from both sur-

faces. It was found in Dwelling No. iii at a level referable to the second occupation.

It will be observed that none of these beads came from the level of the first occupation of Dwelling No. iii, or from a contemporary floor elsewhere. With the exception of the cylindrical bone bead they appear to be referable to the second period of occupation.

Ring of Steatite.—One-half of what appears to have been either a pendant or a finger-ring of steatite, unpolished, was found on the level of the hearth of the second occupation of Dwelling No. iv. It was flattened on the upper and lower surfaces, tapered towards the broken ends, and measured $\frac{3}{4}$ inch in diameter (fig. 31, No. 2).

BONE OBJECTS.

Dwellings Nos. ii, iii, iv, and the middens in the vicinity of the last two, produced a very large collection of bone artefacts.

It will be remembered that very few were found in Dwelling No. i. Similarly, from the earlier site, Dwelling No. ii, the crop was very meagre, only amounting to five. Among these, however, was a fine knife-shaped object (fig. 4), fashioned from the scapula of an ox. The other objects were all awls or piercers.

From the other sites, however, there came no less than 139 objects, most of which are illustrated in figs. 32-39. These consist of chisel-ended tools made from cannon bones of oxen, both socketed and otherwise; scapulas of oxen which have been used as shovels; blunt-ended blade-shaped tools, usually much worn; phalangeal bones of oxen perforated completely, or through one wall only; objects made from the perforated heads of femurs; numerous awls or piercers, and miscellaneous specimens.

Chisel-like Tools.—These numbered twenty-one. All, with one exception (fig. 33, No. 9), came from the earliest levels of occupation. The exception, which is a split bone with a rounded end, came from the level of the top of the remaining lintel over the earth-house *m*, a position which might associate it with the second occupation of Dwelling No. iii, but in respect that the roof of the earth-house at this point was sunk beneath the floor of the period to which it was referable, this tool might also belong to the earlier occupation.

Socketed chisels, perfect and imperfect, numbered eleven (fig. 32, Nos. 1-11). Of these, four (Nos. 1, 2, 3, and 7) were found on the earliest occupation level of Dwelling No. iii. No. 1 is formed from the metatarsal bone of an ox, cut or sawn obliquely and socketed at the process end. Apparent saw marks are visible on the oblique surface. No. 2 is similarly made. No. 3 is formed from a similar bone. No. 7 is



Fig. 32. Socketed Chisels.

also fashioned from an ox metatarsal. No. 4 came from the passage leading out of Dwelling No. iii. to the south-west. It is made from an ox metacarpal. Saw marks are visible on the oblique surface. No. 6, made from the cannon bone of an ox, was found in Midden A. Two (Nos. 8 and 11) were found in Midden B. Both are made from the metatarsal bones of oxen. On the surface of the cutting edge of No. 11 there are numerous saw marks. No. 9 is fashioned from a sheep bone, and was found in Midden D. No. 5, made from an ox metacarpal, was found at the base of an isolated piece of wall to the east of chamber M of Dwelling No. i.

There were found ten unsocketed chisel-like tools (fig. 33, Nos. 1-10). Of these, three (Nos. 2, 9, and 10) were found in Dwelling No. iii. Two are made from ox bones and are imperfect, having been split. No. 10 was recovered from the floor of chamber *n* and so is referable to the first occupation. No. 9 was found at the level of the top of the lintel over the earth-house *m*, and so might belong to the second occupation period, as probably also did No. 2, which was found below the floor of the third occupation. No. 1, formed from an ox metacarpal cut through obliquely was found on the east side of Midden A. No. 3, made from an ox metacarpal, was found in Midden A. No. 4, 3½ inches long, made from one half of an ox metatarsal, was found also in Midden A. No. 5, made from the process-end of the leg bone of an ox, with all the prominences rubbed down, was found in Midden A. (There are numerous cut marks on the surface as if made with a sharp metal tool.) No. 6, from an ox metacarpal, split and rubbed down from both surfaces to a cutting edge, was found to the south-east of Dwelling No. iii. No. 7, fashioned from a metatarsal bone, was found in opening out Dwelling No. iv. No. 8, fashioned from one half of a split ox metatarsal, was found in Midden C.

Scapulae of oxen, which have been used as shovels (fig. 34, Nos. 1 and 2), were found to the number of eight, within Dwelling No. iii and on sites referable to the earlier occupations. From Dwelling No. iii two typical examples came from chamber *p* and one from *b*. Of the former, one was found just beneath the small chamber at the entrance to the earth-house *m*, and might be referable to the second occupation, and the other on the floor-level. The third was found in chamber *b* at a level 14 feet over Ordnance Datum. Two were found in Midden B and one in Midden D. The remaining specimens were found while clearing ground to the east of Dwelling No. iii.

Knife-like Objects.—Two objects like knives fashioned from scapulas of oxen (figs. 4 and 35) were found—one (No. 4) in Dwelling No. ii and consequently of early date, and the other while exploring ground to the east of Dwelling No. iii. The former (fig. 4) is a gracefully fashioned



Fig. 33. Unsocketed Chisels.

tool, much striated on its surface, possibly from rubbing with pumice in the course of its reduction. The latter is imperfect, and has not been such a well-fashioned tool.

Awls, Pins, and Boring Implements.—The majority of the bone objects fall under this heading, and it is significant that they chiefly belong to the later occupation levels rather than to the earlier.

It does not seem possible to differentiate between pins and awls.



Fig. 34. Scapulae used as Shovels.



Fig. 35. Kufle-like Object of Bone.

and there has accordingly been no distinction made in classifying them. A distinction has, however, been drawn between sharp-pointed borers and blunt-pointed tools.

Sharp-pointed Borers.—In this class there are some fifty objects, made for the most part from splinters of bone and showing various degrees of finish. Of these fourteen were found in Dwelling No. iii and are shown in figs. 36, 37, and 38.

Fig. 38, No. 2, is made from a bird bone. It was found associated with pottery of the third occupation adjacent to the entrance to the earth-house *h*.

Fig. 37, No. 6, is a splinter from an ox bone, rubbed down to a point at one end and polished by use, and was found in *h*.



Fig. 30. Awls, Pins, and Boring Implements.

Fig. 37, No. 7, is made from a splinter of a sheep bone. It was found in the entrance to *h*.

Fig. 37, No. 9, is made from a sheep bone. It was found in earth-house *h*, and consequently belongs to the third occupation.

Fig. 36, No. 16, is a pointed ox bone found in opening out the earth-house *m*, so is probably referable to the second occupation.

Fig. 36, No. 7, is a splinter of an ox bone worked to a point and was found at the level of the lintel over *m*.

Fig. 36, No. 18, is fashioned from a splinter of a sheep bone, and was found in opening out earth-house *m*.

Fig. 36, No. 22, is a sheep metatarsal, one end of which has been broken off obliquely and the remaining side worked to a point. It was found on the top of the wall-head of *m*.

Fig. 38, No. 3, is made from the cannon bone of a sheep rubbed down and polished and was found on a spot at the level with the top of the lintel over *m*.

Fig. 38, No. 5, is made from a splinter of a sheep bone and was found above *m*.

Fig. 38, No. 18, is a small fragment of a sheep bone reduced to a smooth surface all over and sharply pointed to one end. It was found on the top of the wall-head of *m*.

Fig. 38, No. 19, is a sharply pointed sheep bone and was found in clearing out the earth-house *m*.

Fig. 38, No. 26, is made from a sheep metatarsal, rubbed down to a sharp point, and was found in interior of Dwelling No. iii.

Fig. 36, No. 10, is a splinter of a bird bone which has been worked to a point. It was found at the north-east end of the slate box in chamber *b* and possibly belonged to the first occupation.

It will be observed that, with three exceptions, all these objects from Dwelling No. iii were either found within earth-house *h*, or in the immediate vicinity of *m*, and of the exceptions one was found outside the door of *h*, and the other adjacent to the slate boxes in *b* which must have been a late intrusion.

Dwelling No. iv. produced eight specimens illustrated in (figs. 36 and 38).

Fig. 36, No. 11, is a splinter of an ox bone worked to an oblique point at one end.

Fig. 36, No. 12, is made from a large splinter of an ox bone.

Fig. 36, No. 19, is a splinter from a sheep bone.

Fig. 36, No. 20, is a small triangular splinter of ox bone rubbed down, smoothed all over, and pointed at both ends.

Fig. 36, No. 25, is a splinter of a bone of a large sheep.

Fig. 36, No. 26, is a curved splinter from an ox bone.

Fig. 38, No. 9, is a splinter of a sheep bone with the point amissing.
Fig. 38, No. 25, is made from a splinter of a sheep bone.



Fig. 37. Bone Objects found in the Earth-house A.

Midden A yielded seven specimens (fig. 36, Nos. 1, 5, 9, 17, 21, and fig. 38, Nos. 6 and 10), in general similar to the foregoing.

Midden B produced one (fig. 38, No. 12) of no special interest.

Midden C yielded six (fig. 36, Nos. 3, 4, 15, and 24; fig. 38, Nos. 7, 23, and 24), of which only one (fig. 38, No. 7) has a particular interest in being made from a bird bone. The area to the east of Midden A produced three (fig. 36, Nos. 2 and 6, and fig. 38, No. 17).

FURTHER EXCAVATION AT JARLSHOF, SHETLAND. 269

In a midden in the south corridor to the east of Dwelling No. iv, 4 feet below the adjacent wall-head, was found a well-fashioned awl, made



Fig. 38. Awls, Pins, and Boring Implements.

from the metatarsal bone of a sheep (fig. 36, No. 23), and another awl (fig. 36, No. 13).

Fig. 36, No. 27, and fig. 38, No. 12, were found at the base of a cross wall in the area to the south-east of chamber M of Dwelling No. i, associated with the chisel (fig. 33, No. 5), and so are probably referable to an early date.

Fig. 36, No. 14, and fig. 38, Nos. 15 and 20, were found in Midden D, and so are also probably of early date.

Fig. 38, No. 11, made from a splinter of a sheep bone, and pointed at both ends, was found in the remains of an early chamber to the north of Dwelling No. iv.

The only other specimen (fig. 38, No. 22) is a splinter with no particular interest, and was found to the south-east of *j*.

Blunt-pointed Tools.—Into this category have been placed tools which, though obviously intended for piercing, have a blunt point. They number nine, and are shown in fig. 39.

No. 1, made from the radius of a large sheep, was found in Midden C, and so belongs to an early period.

No. 2, a portion of a split ox bone, was found in *k*.

No. 3 is one-half of a split ox metatarsal, worn, and polished to a rounded point at one end, and was found in Dwelling No. iv.

No. 4, made from the tibia of a sheep, and partially split, was found in the east corridor.

No. 5, made from a splinter of ox bone, and smoothed with use, was found in Midden D.

No. 6, made from an ox bone, was found in the south corridor.

No. 7, a splinter of ox bone, was found in Midden D.

No. 8, made from a splinter of a sheep bone, was found to the south of *j*.

No. 9 is a splinter of a sheep bone much rubbed down and polished with a rounded point, found in Dwelling No. iv.

Phalangeal Bones, Perforated.—Six ox phalangeal bones were found, with holes pierced right through them in five cases, and through one wall only in the other. All were found in Dwelling No. iii, and five of them were recovered from the floor of the earth-house *h* and are shown with the other bone relics from that site in fig. 37, Nos. 1 to 5. The other example was found in a small enclosed space at the side of the primary hearth in Dwelling No. iii. The purpose which these objects served is unknown. The perforation is large for the size of the bone, and shows no signs of wear such as might be caused by a cord if they had been worn in suspension. On the other hand, it will be observed that the perforation is always made at the distal and lighter end of the bone, which would obviously be done if suspension was intended.

The phalanx of a small ox pierced near its distal end, was found by Mr Arthur J. H. Edwards, F.S.A.Scot., within a chambered cairn at Lower Dounreay, Caithness, associated with fragments of neolithic and beaker pottery, a stone axe, and human remains; and the occurrence of another phalanx, similarly pierced, in a Stone Age kitchen-midden at Oram in Denmark, is reported by Mr Edwards in his account of the

excavation of the above-mentioned cairn.¹ An example was picked up by me on the Links of Quendal, a few miles distant from Jarlshof,



Fig. 30. Blunt-pointed Tools.

where numerous relics show the former existence of a culture contemporaneous with that at Jarlshof.

Heads of Femurs, Perforated.—Two heads of femurs were found, both perforated (fig. 37, No. 8, and fig. 39, No. 10). The former was found in the earth-house *h*, and the other in Dwelling No. iv. In each case the apex

¹ *Proceedings*, 1928-9, vol. lxiii, p. 138.

has been worn as if by the pressure of some object, such as a plate resting on it. There are a number of perforated femur heads in the National Museum of Antiquities found in brochs in Caithness and elsewhere, and believed to have been used as whorls. It is doubtful if the Jarlshof specimens have been so used, for no other whorls have been found in their vicinity, and the friction mark on the apex of the bone suggests some other purpose.

Miscellaneous Bone Objects.—Fig. 37, No. 10, is a plate of cetacean bone, measuring superficially $5\frac{1}{2}$ inches by $3\frac{1}{2}$ inches, with a depression towards the centre of each face. It was found in the earth-house *h*.

Fig. 40, No. 4, is a small object, smoothed all over as if by constant use. It was found in chamber *n* of Dwelling No. iii.

Fig. 40, No. 5, is another tool of the same class. It is made from the metacarpal of an ox, bluntly pointed at each end and reduced to a smooth polished surface all over. It was found to north of Dwelling No. iv.

Fig. 40, No. 16, is a smooth piece of sheep bone, rounded at one end. It was found on the floor of earth-house *m* in Dwelling No. iii.

Fig. 40, No. 18, is an implement of the same sort as Nos. 4 and 5, made from a splinter of an ox bone and worked to a smooth surface all over. It was found in the area to the east of Midden A.

Tools of the character of the above described were also found at Skara Brae.¹ They may have been employed in finishing the surface of pots by polishing, or otherwise.

Fig. 40, No. 1, is a splinter of an ox bone, chisel-ended at one termination and worked to a blunt point at the other. Many striae appear on the surface, probably produced in the course of manufacture.

Fig. 40, No. 2, is a blunt-pointed object of sheep bone found in Midden B.

Fig. 40, No. 3, is the calcaneum of an ox, partially reduced to a flat surface by friction on one surface, found to the south-west of Dwelling No. iv.

Fig. 40, No. 6, is a spatulate object of bone made from an ox rib worked to a plano-convex section, found in Midden A.

Fig. 40, No. 7, is a round-ended fragment of polished bone found on the top of the lintel of earth-house *m* in Dwelling No. iii.

Fig. 40, No. 8, is a round-ended chisel-like object of bone found above the floor-level of *m* in Dwelling No. iii.

Fig. 40, No. 9, is a flake of a large rib bone of an ox which has been worked down at both ends, found above *m* in Dwelling No. iii.

Fig. 40, Nos. 10, 11, and 12, are the ends of implements worn at the point, made from cetacean bone, found adjacent to Midden B.

¹ V. Gordon Childe, *Skara Brae*, p. 122, fig. 13, B2.

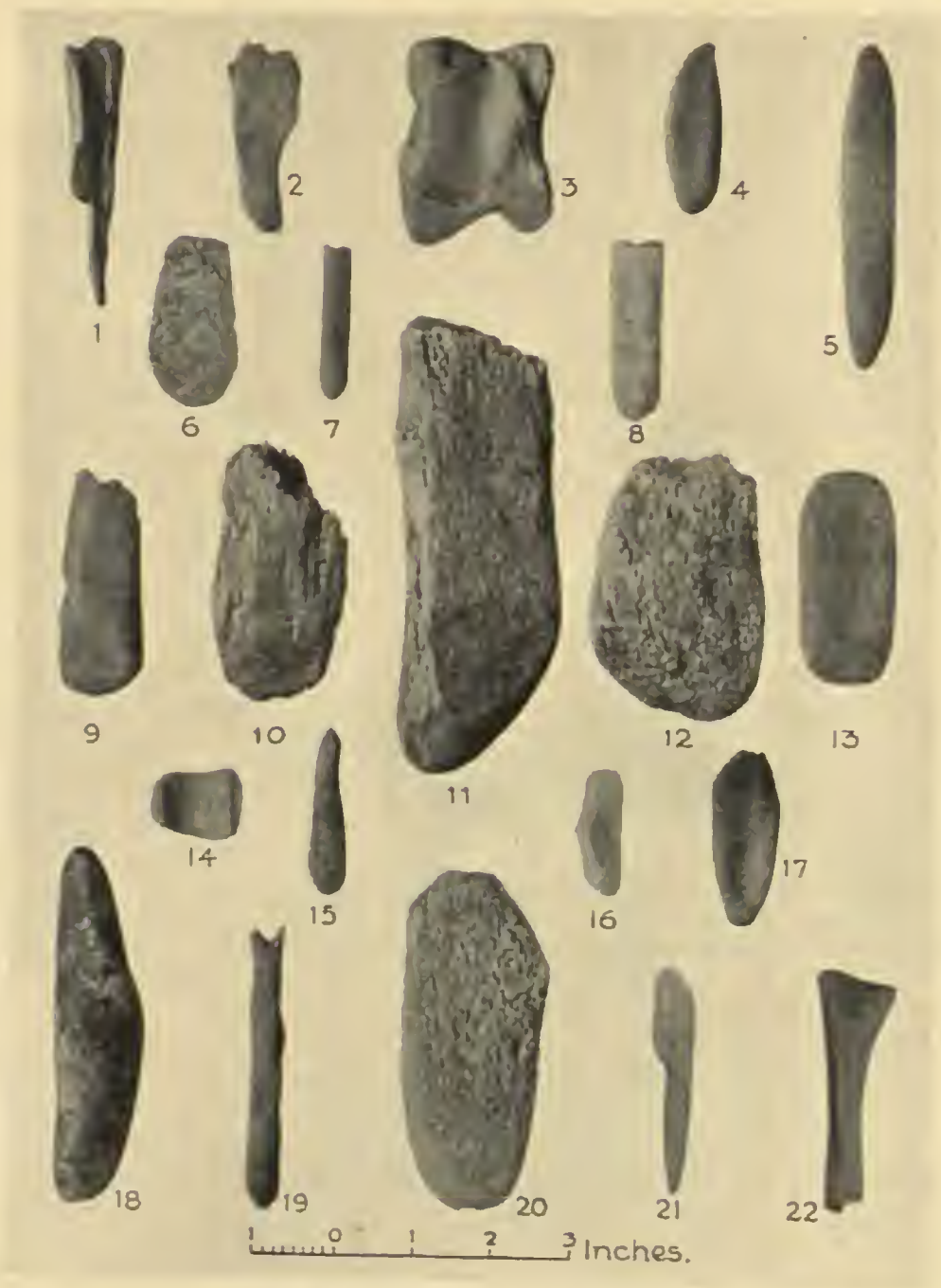


Fig. 40. Miscellaneous Objects of Bone.

Fig. 40, No. 13, is an oblong plate made from an ox rib, with rounded ends. It is much strinted and came from chamber *b* in Dwelling No. iii, some 6 inches below the level of the top of the slate box.

Fig. 40, No. 14, is part of a penannular ring of ox bone, $\frac{7}{8}$ inch in breadth, rounded off at the end, found in opening out the original entrance passage of Dwelling No. iii, which was used as access to the midden in the second period, but closed in the third.

Fig. 40, No. 15, is a small blunt-ended object of ox bone found below the secondary entrance into Dwelling No. iii.

Fig. 40, No. 17, is an oval implement of ox bone rubbed smooth all over and bluntly pointed to one end. It was found in Midden D.

Fig. 40, No. 19, is a splinter of a sheep bone bifurcated at one end. It was found in Dwelling No. iii above the earth-house *m*. A similarly fashioned bone was found in the earth-house at Foshigarry in North Uist.¹

Fig. 40, No. 20, is the end of an implement, worn at the point, made from an ox bone, and found in chamber *j*.



Fig. 41. Portion of a Perforated Hammer-head. (f.)

Fig. 40, No. 21, is an object in appearance resembling a knife-blade with a tang. It measures $2\frac{1}{2}$ inches in length and was found in Midden C.

Fig. 40, No. 22, is a fragment of an implement of ox bone rubbed down to a smooth chisel-like edge at one extremity, found to the north of Dwelling No. iv.

Fig. 41 is the half of a perforated hammer-head made from the humerus of a small whale.

BRONZE RELICS.

Only three objects of bronze were found (fig. 42). The first, an oblong plate, with one end turned back to form a loop, was found within the earth-house *m* in Dwelling No. iii. The second object, a ring, was found at the edge of Midden B; the third, an imperfect plate of bronze

¹ *Proceedings*, 1920-1, vol. lxx, p. 530, fig. 22, No. 6.



Fig. 12. Bronze Relics.



Fig. 13. Fragment of Crucible. (4.)

with part of a rivet hole at either end, was found near the surface to the north-west of Dwelling No. iv.

CRUCIBLES.

Eleven pieces of crucible were found, unfortunately all too small to indicate with certainty the form of a complete vessel.¹

The largest fragment was found in Midden A. It is a segment $3\frac{1}{2}$ inches long, of a round-bottomed vessel, tapering to one end, the wall diminishing from 1 inch to $\frac{1}{2}$ inch in thickness in one direction, while the bottom rises. The fragment suggests a boat-shaped vessel with a depth of about 2 inches, and an interior width of $3\frac{1}{2}$ inches. The material of which it is made is somewhat spongy in texture and friable. It is illustrated in fig. 43. Another fragment was found in a filling of stones at the back of one of the uprights forming a side of the so-called furnace in Dwelling No. iii, and would belong probably to the second occupation. Six fragments were found while opening out Dwelling No. iv. Two pieces came from the earth-house *h*; one from the side of the hearth of the second occupation in Dwelling No. iii; and another from the small enclosed area beside the primary hearth in the same Dwelling.

GROOVED STONES.

Three blocks of sandstone (fig. 44), two of them triangular and the third approximately so, with deep grooves, formed on the apex of each and



Fig. 44. Grooved Stones. (Ca. I.)

worn smooth, very markedly in the smallest example, and less so in the others, were found, two in situations referable to the early

¹ Among the relics from Haag, in Denmark, were found a sufficient number of fragments of a late Bronze Age crucible to admit of a partial reconstruction, an illustration of which appears in the *Mémoires de la Société Royale des Antiquaires du Nord*, 1906-13, p. 150.

period, viz. the floor of chamber *l* in Dwelling No. iii and the area east of Midden A, while the other came from Dwelling No. iv. The purpose of these stones is not obvious, but the groove suggests that it was made for keeping a rope in position, in which case they were probably used for tethering an animal, or for anchoring a boat.

HONES.

Four hones or polishers of fine grained sandstone were found in Dwelling No. iii; two of one type, and two of another. The former—



Fig. 45.

small, quadrangular in section, and tapered—came from a high level, and belonged evidently to a late period. The latter—longer, thin, and flat—were both found at the level of the second occupation. They are illustrated in fig. 45, Nos. 1, 2, 4, and 5. No. 3 was found in Midden D.

LEATHER.

On the level of latest occupation, associated with the pottery whorls, was a short strip of leather which appeared to be ancient.

MOULDS.

Fragments of clay moulds for casting objects of bronze were found in considerable numbers during the course of the excavation. They were associated in Dwelling No. iii with the earliest and the second occupations only. A very large number of pieces were found in the material with which chamber *j* and the passage out of it had been filled; many were recovered from Midden A, a few from Midden B, several from the area to the north of Dwelling No. iv, and also from the ground cleared, showing indefinite remains of building to westward of Dwelling No. i. It has already been observed that none were found in Dwelling No. iv, neither did the early midden, C, yield any examples; nor were there any fragments found in the area east of Midden A in association with the early pottery.

In all, there were recovered some seventy-nine pieces of sufficient importance to be registered, the other fragments being chiefly portions of the envelopes in which the moulds had been encased. These fragments are, for the most part, of sword moulds, but there are also pieces of moulds for socketed axes, for leaf-shaped spear-heads with a pronounced midrib, and two pieces of moulds for indeterminate objects.

The sword moulds greatly predominate; and while it is not possible from the fragments to estimate exactly the number of different moulds represented, judging from the colour, the shape of the keys and sockets, and the treatment of the matrix, the numbers are probably slightly in excess of thirty. In contrast to the finds of previous years, quite a number of these fragments of sword moulds are parts of moulds which have never been used—indicating the probability that they were fashioned on the spot. There are only nine pieces of moulds for socketed axes—all parts of used moulds.

The pieces, apparently parts of spear-head moulds, numbered six and possibly represented only two or three weapons.

Sword Moulds.—Among the pieces of sword mould are several of particular interest, though none of them add much to the knowledge which we acquired previously. Eight fragments which appear to be all parts of the same mould were found in the filling when clearing out a blocked passage between the chamber *j* and the passage *r*. They included a portion, $5\frac{1}{2}$ inches long, of the greater part of one side of a matrix for a hilt. In the casting, provision had been made for two rivet holes for the attachment of the grip, which were represented by two prominences in the centre line of the mould. This part of the mould presumably had been a reconstruction of the original hilt portion, as at the butt end there remain on the face of the exposed section three, out of an original number of five, tenons. These have fitted into a corre-

sponding number of sockets in the adjacent section of the mould fortunately recovered (fig. 46, Nos. 1, 1A, 1B).

Another section of the blade portion of a mould, 2½ inches long, shows on the back the impression of a flat plate, upon which the mould has been supported when soft, crossed by three impressions of some indeterminate material (fig. 46, Nos. 2 and 3). The impression of a reinforcing rod was observed on the back of a mould found in Dwelling

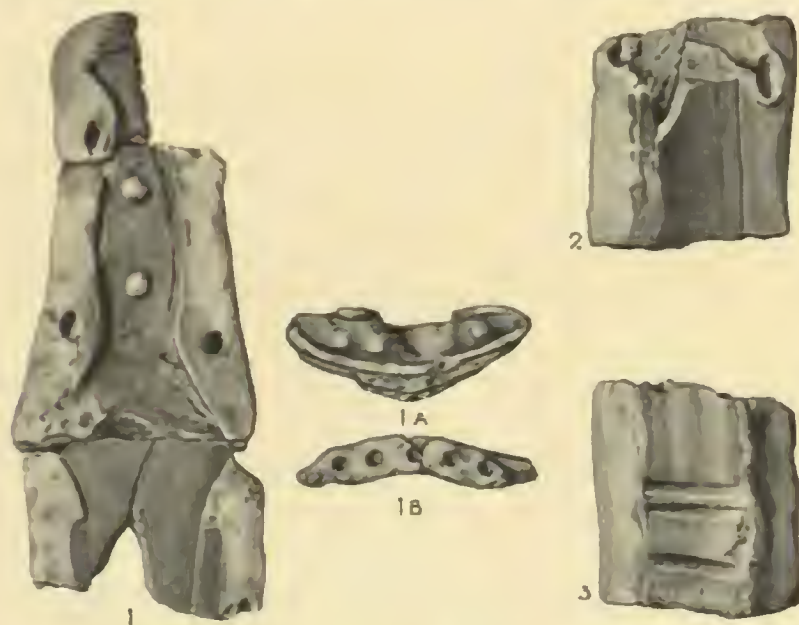


Fig. 46. Parts of Sword Mould showing arrangements for attachment of Hilt Portion and for reinforcing the Mould. (1.)

No. i in 1932¹ The above fragments were all seemingly part of the same mould, the various unusual features of which indicate that there had been difficulty in its construction.

A piece of a matrix, unused (fig. 47, No. 7), found in clearing out chamber j, was for the end of the hilt-plate, and had made provision for a flange on the lower edge. There was also a portion of an outer envelope found in chamber j, on the inside of which was a ridge about ½ inch broad, the cause or purpose of which is not obvious.

Three pieces of unused moulds were found on the floor of chamber l with a number of rude stone implements, and showed on the surface the impression of a wooden pattern employed to form the matrix.

¹ *Proceedings*, vol. lxvii. p. 110, 7.

A section of one side of a matrix, found about 6 inches below the floor-level of the second occupation, showed various apparent finger impressions on the back.



Fig. 47. Fragments of Clay Moulds.

A considerable portion of the upper part of a matrix was found in Midden A, showing the wings of the blade with rivet holes and flange (fig. 47. No. 8). The prominences to form the rivet holes have been broken off, but holes in the surface of the mould indicate where they have been. A hollow runs up the matrix into the hilt, where it is

stopped, indicating that the convexity of the blade has been continued into the hilt-plate.

The most perfect section of a mould so far recovered was found on the north side of Dwelling No. iii, on the first occupation level, at



Fig. 48. 1, Complete Section of a Sword Mould. 2, With broken Portions laid aside to expose the Matrix.

13.13 feet above Ordnance Datum. It consisted of a section from the central portion of an unused mould, complete with both valves and outer envelopes, and measured 10 inches in length by $3\frac{1}{2}$ inches in breadth (fig. 48). The matrix was enclosed within two layers, or envelopes, and on the side of the inner one, where exposed, are the impressions of some thin ligature which had been used to hold the

two valves in place.¹ Though the section was complete when found, as it dried the two portions from either end became detached.

The pouring gate (fig. 49), illustrated also in last season's report, was actually found in one of the slate boxes in Dwelling No. iii. It measures $2\frac{5}{8}$ inches in height, and $2\frac{1}{4}$ inches by $2\frac{3}{8}$ inches in diameter at the mouth, which is oval. On the under side is apparent the impression of the top of the mould against which it was fitted. A portion of another gate, amounting to about two-thirds of its original extent, was found in the area to the north of Dwelling No. iv. It measures $2\frac{1}{2}$ inches in longest diameter by $1\frac{1}{2}$ inch broad by $1\frac{3}{4}$ inch deep.



Fig. 49. Gate of Sword Mould. 1, View from below, 1a, Elevation. (4)

Axe Moulds.—The fragments of axe moulds came from the lowest level of Dwelling No. iii, from Midden A, and from the area to the north-west of Dwelling No. iv. They revealed no features of particular interest. Fig. 47, No. 3, shows a portion of a cutting edge.

Spear Moulds.—The pieces of spear moulds (fig. 47, Nos. 4, 5, 6, and 10) all came either from the later middens, the area to the west of Dwelling No. i, or to the north of No. iv.

Indeterminate Fragments.—A fragment of a mould for a circular object came from Midden B.

Fig. 47, No. 9, shows another fragment found to the westwards of Dwelling No. i. On the matrix surface there is a well-defined hollow, $\frac{1}{16}$ inch broad, running from end to end, on one side of which the matrix is slightly convex and on the other flat. This may possibly be part of a mould for a sword-chape similar in some respects to a fragment in the

¹ A fragment of a mould in the Mortimer Collection in the Municipal Museum at Hull similarly shows the impressions of a cord obviously used for the same purpose.

collection above referred to in the Hull Municipal Museum, and illustrated in the issue of the Hull Museum Publications, No. 169.

Clay Core.—A small conical object of baked clay, with traces of bronze on its surface, is evidently the core of the socket of a small bronze knife, as it exactly fits the socket of such an object in the Bell Collection in the National Museum of Antiquities (DK. 38).

POTTERY.

The pottery from Dwelling No. ii, except for the sherd with chevron ornament found projecting from the angle formed by the junction of the slabs in the smaller slate box, was of little significance. It consisted of some eleven fragments, small and unimportant, with neither a rim nor the edge of a base represented. Nine of the pieces came from a level 6 inches above the actual floor. The largest fragment, $\frac{1}{8}$ inch in thickness, has large grains of steatite in the body and a black polished exterior surface, in these respects resembling one or two sherds found in Dwelling No. i.

The pottery found in Dwelling No. iii and its immediate vicinity may be divided into four classes: (1) Vessels with sides straight or slightly inverted, having the lip either flat on the top or rounded, and sometimes turned over externally so as to form a roll moulding; occasionally with the moulding $\frac{1}{4}$ to $\frac{1}{2}$ inch below the rim; and more rarely with an additional rounded fillet $\frac{1}{4}$ inch or so below the other; hard red ware with no steatite in the body; (2) pottery with a rim, flat or rounded, on the top, and a flange projecting to the interior; having a backing of chips of steatite in the body; (3) vessels with a well-defined shoulder and a hollow under the rim, giving in profile an ogee curve; and (4) a class not largely represented and of late date, in which the well-defined shoulder has given place to a rather flat curve extending from the intake below the rim to the base.

The pottery of the first class belongs exclusively to the earlier periods, the first of the occupations of Dwelling No. iii here dealt with, and the occupation of the site which preceded it. From the floor of chamber o in Dwelling No. iii came one of the few ornamented sherds (fig. 52, No. 6) which is marked on the exterior with vertical strokes. The examples with the bead mouldings were found, with one exception, in areas referable to the earlier era, but it is right to qualify that statement by mentioning that rims of pots were of infrequent occurrence on the lowest level of Dwelling No. iii. Fig. 51 shows a pot of the earliest period, reconstructed from fragments which were found



Fig. 50. Core of
Socket of
Bronze Knife.
(1.)

in clearing out chamber *k*. Fig. 52, Nos. 3 and 4, show rims found in Midden A associated with Dwelling No. iii. The exception (fig. 52, No. 1) was found immediately below the floor of the small chamber on the site of the entrance to the earth-house *m*, and accordingly of a date previous to the second occupation. An example without a moulding (fig. 52, No. 2) was found at the floor-level of chamber *p*. Fig. 56, No. 10, shows a section of a base of a pot of this early ware found in opening out the original entrance to Dwelling No. iii.



Fig. 51. Reconstructed Pot of Earliest Period.

Among the debris which constituted the backing for the wall of Dwelling No. iii to the west, and between the primary entrance *q* and the secondary entrance *r*, were found numerous sherds, all with one exception (fig. 53, No. 6) (which is obviously late, and found at a comparatively high level), belonging to this early type, and including

specimens with bead mouldings below the rim (fig. 52, Nos. 7-12, and fig. 53, Nos. 4 and 5). Among these sherds there occurs a fragment of a base (fig. 53, No. 4) showing a clearly defined angle formed by the junction of two sides, also a piece of a straight rim showing a slight bend at each end (fig. 53, No. 5), thus indicating the use of square vessels as well as round, an assumption further borne out by the discovery of rectangular slates, apparently pot lids.

Midden C, which from its relative depth was evidently the earliest of the four middens which lay to the west of Dwelling No. iii, yielded solely pottery of this character (fig. 53, Nos. 1, 3, 7, and 8, and fig. 54, Nos. 2 and 3). Fig. 54, No. 1, shows a base of a vessel of the same ware.

The pottery of the second class, *i.e.* with a flange to the interior, definitely belongs to the second period of occupation of Dwelling No. iii, as examples were found in the earth-house *m* belonging to that period, at a level some 3 feet below the upper surface of the remaining hutel. Several examples found at this spot were of a black ware heavily backed with steatite, and ornamented with finger-tip impressions on the surface of the rim (fig. 54, Nos. 8 and 9).¹ Another sherd (fig. 56, No. 3), came

¹ Among the pottery fragments recovered by Mr and Mrs Cunnington in their excavation of the Early Iron Age inhabited site at All Cannings Cross Farm, Wiltshire, and preserved in the museum at Devizes, there is a portion of a rim with a marked projection inwards and finger-tip impressions on the surface, and in the late Bronze Age pottery found at Scarborough (*see* Reginald Smith, F.S.A., in *Archæologia*, vol. lxxvii. (1927) p. 101) finger-tip impressions are freely used, not on the rims, but on applied fillets.

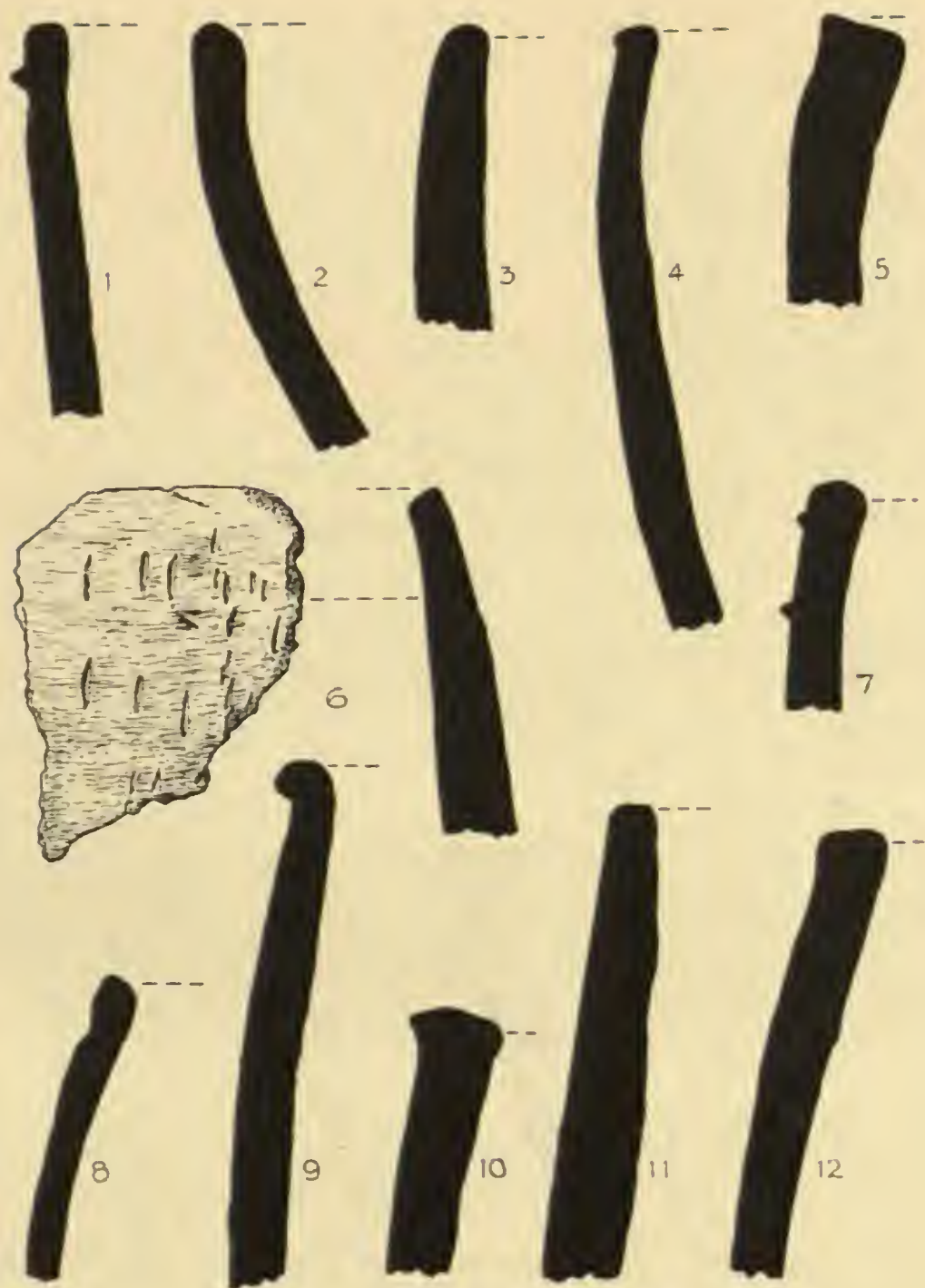


Fig. 52. Sections of Pottery of the Earliest Period. (1.)

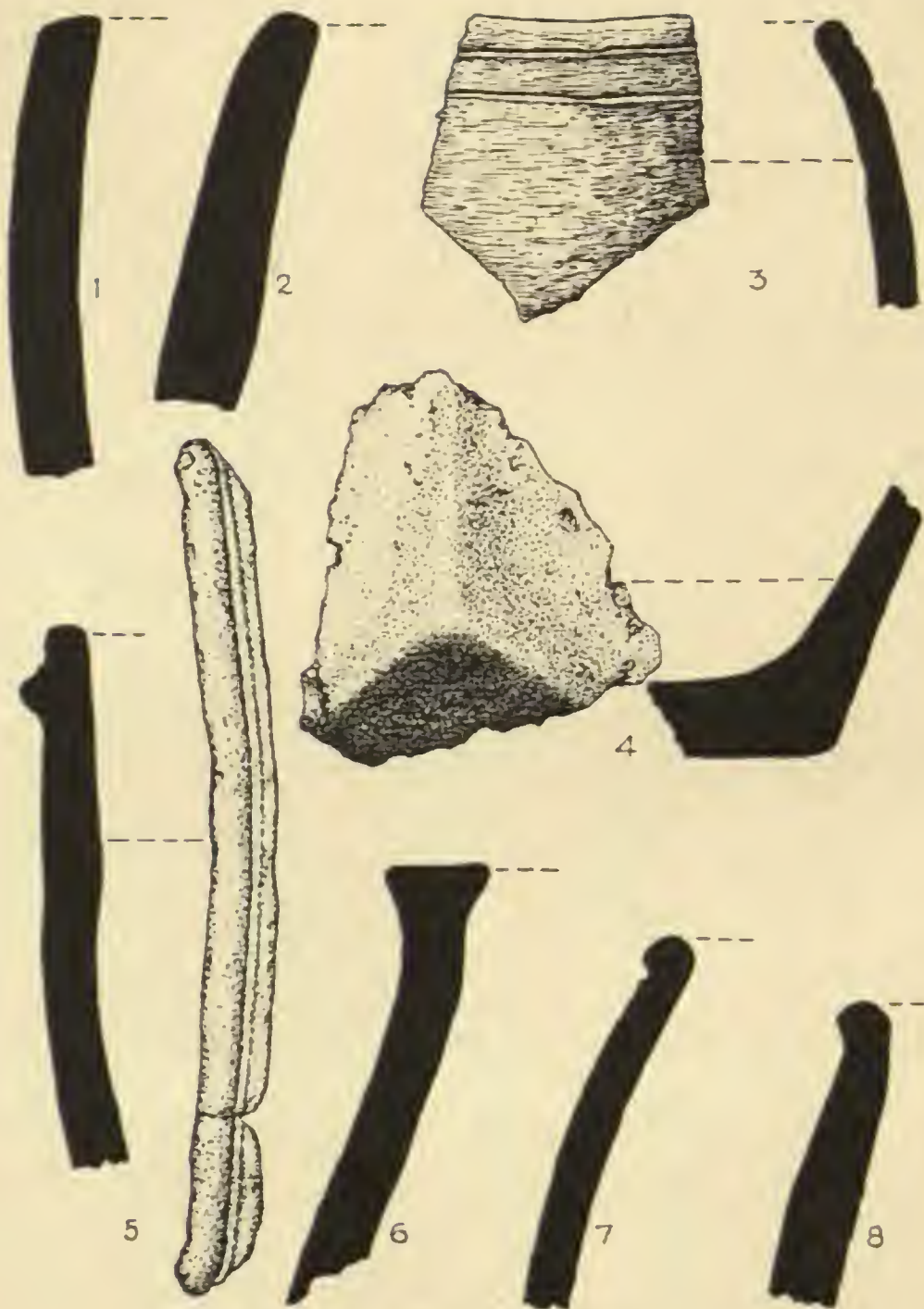


Fig. 53. Sections, etc. of Pottery of the Earliest Period. (1.)

from a spot about 1 foot below the third floor, as found in chamber *j* on the western arc. It is of a fine red body with finely ground particles of steatite in its composition, and is decorated along the mesial line of the upper surface with a row of pin impressions.

A rim of a different pot (fig. 54, No. 7), found on a level with the top of the lintel in *m*, though not showing the same marked projection inwards, is also decorated with pin impressions on the surface.

Fig. 55, No. 1, gives the section of a sherd with a marked projection of the rim to the interior and a hollow and bulge on that surface, while the exterior is straight. This piece came from the level of the red ash hearth of the second period. Fig. 55, No. 3, is a section of a sherd from the same spot showing the shoulder as normally on the exterior.

The pottery of the third class, though mainly a product of the third period, was not absolutely confined to it, as may be gathered from the following examples. A section of a characteristic pot is shown in fig. 55, No. 4. It has been a vessel of large dimensions with an estimated diameter of about 1 foot. The body, much backed with steatite in fine grains, is rough and unpolished in the interior, but polished and blackened on the exterior surface. It was found below the floor-level of the third occupation in *j*. Fig. 55, No. 6, shows a similar section of a sherd of a small vessel, with an estimated diameter of 5½ inches, found in the same spot as the last. Fig. 55, No. 5, shows the section of a rim of a small vessel with an estimated diameter of about 7 inches. It is of a finely finished ware with, on the interior, a slightly vesicular surface, and on the exterior a thin pink slip. It was found in one of the slate boxes in *b* associated with the gate of a sword mould. A piece of a somewhat similar ware was found in Dwelling No. i.

Fig. 55, No. 8, is a section of a rim of a coarse heavy pot with numerous grains of steatite in the body. In section the method of its construction is clearly shown. To fashion the rim of the vessel a strip of clay was drawn upwards to double the height required, and thereafter folded back on itself to form the exterior portion. This sherd was found in the second occupation level. Fig. 59, No. 16, shows a section of a similar ware. The pot seems to have been straight-sided, and from an indication of a corner at one extremity of the sherd it has possibly been square-mouthed. Its find-spot was lower than the third occupation floor-level. Fig. 55, No. 9, shows a section of pot having many grains of steatite exposed on its inner surface, which have obviously been rubbed down when the pot was completed. This sherd, found at the level of the red ash hearth, belongs without doubt to the second occupation. Fig. 56, No. 1, is of a sherd of rough ware with numerous grains of steatite projecting from the surface, also



Fig. 51. Sections, etc. of Pottery of the Earliest and Second Periods. (1.)

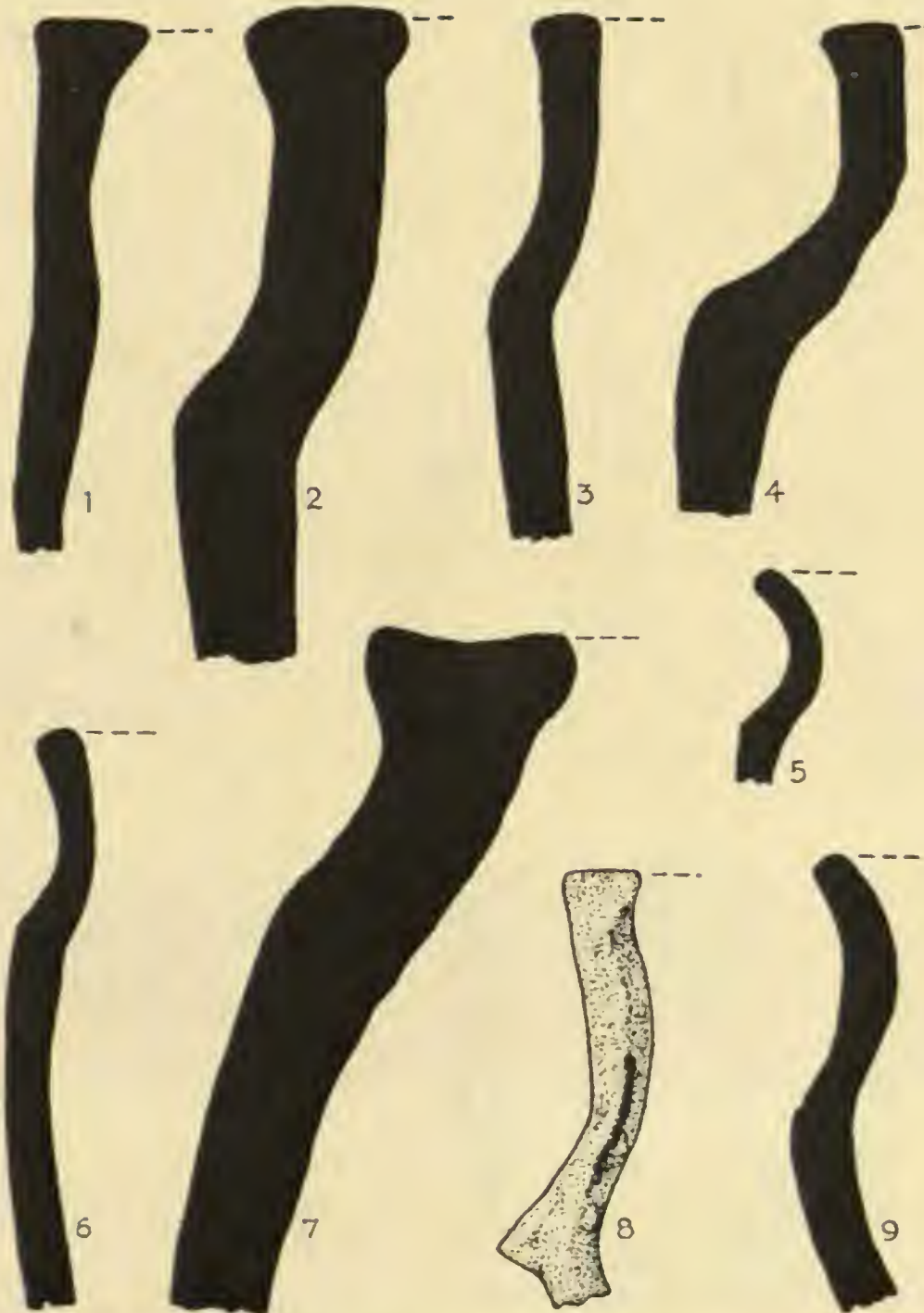


Fig. 53. Sections of Pottery of the Second and Third Periods. (I.)

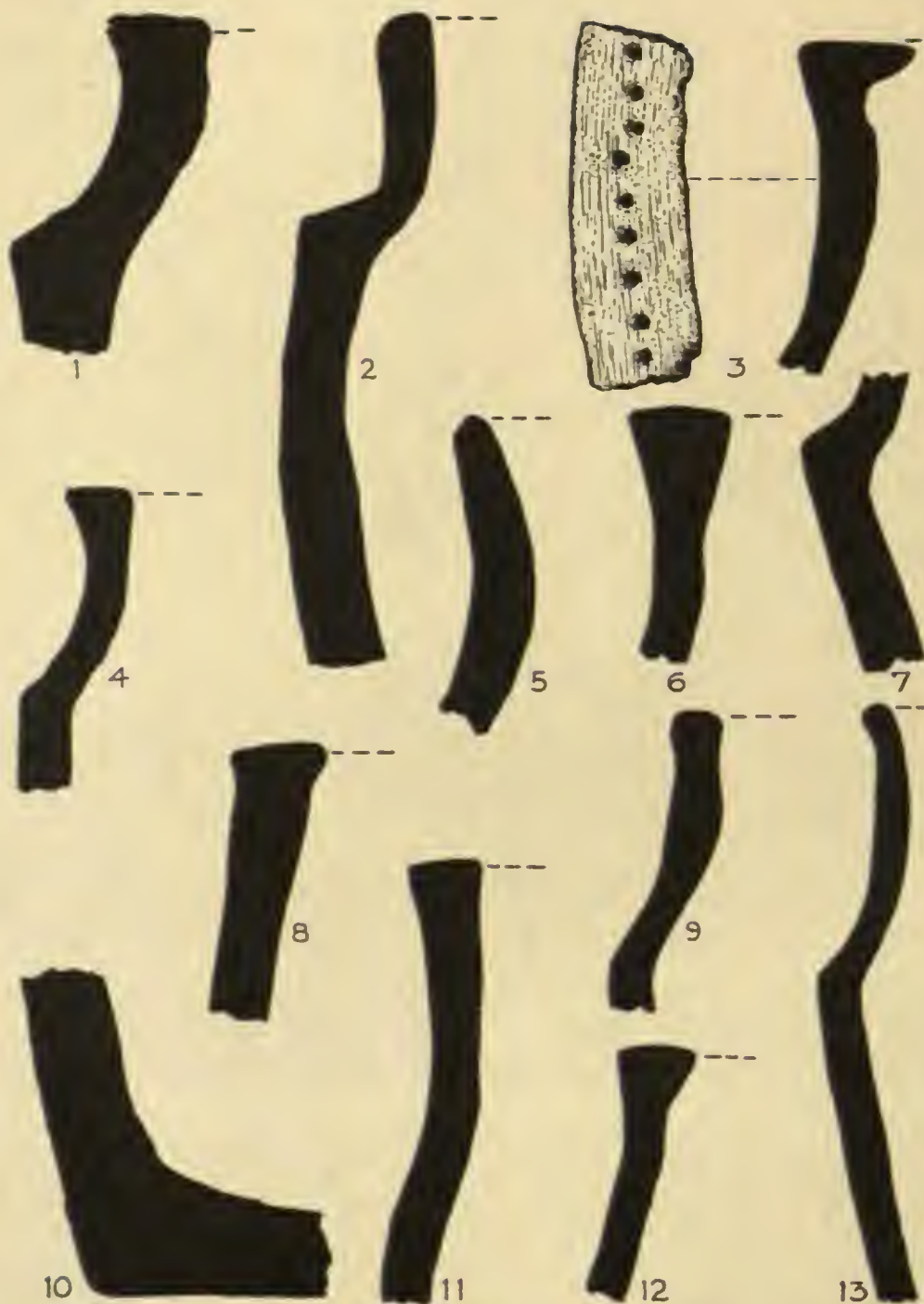


Fig. 50. Sections of Pottery chiefly from the Earth-house A. (I.)

of a second occupation provenance. Fig. 56, No. 2, shows a section of a sherd with a very pronounced shoulder, found just below the third occupation floor at approximately the same level as the previous example. Fig. 55, No. 2, is a section of a sherd of a coarser pot found at a slightly lower level of the same occupation. Fig. 55, No. 4, is of a sherd, from the same level, of similar character, but with the actual rim flat instead of rounded on the top.

The pottery recovered from the earth-house *h* gives a valuable conspectus of the pottery of the third occupation, as the risk of any casual intrusion from a later level, or of confusion with an earlier one, was absent. The pottery of the third class is well represented and that of the fourth also occurs.

Fig. 56, Nos. 5-9 and 12 and 13, show the sections of the various sherds found therein. No. 5 is of a fragment of a light red pot, black in body, and seemingly coated with a slip on both faces, found at the entrance. No. 7 shows a section, at the shoulder, of a heavy black ware with many grains of steatite showing on the inner surface and found as above. No. 6 is of hard grey ware, and flat on the rim. No. 8 is of a buff ware with much steatite in the body, found near the foot of the stair. No. 9 is also of a buff ware with grains of steatite in the body. The sherd indicates a diameter of 6 inches and was found as the previous piece. No. 11 is of a sherd of a large pot with an estimated diameter of 8 inches, with many grains of steatite showing in the body—buff to red in colour—found also near the foot of the stair. No. 12 is a section of a piece of hard buff ware, blackened with soot, from the same find-spot as the last. No. 13 shows a section of a bowl-shaped vessel of black ware, with grains of steatite showing on the interior surface and polished on the exterior.¹

There also came from the earth-house *h* two sherds of coarser ware (fig. 57, Nos. 2 and 4). No. 2 is grey in tone, with an encrustation on its inner surface, and shows an estimated diameter of 12 inches at mouth. No. 4 is blackish ware, and rather coarse. Akin to the foregoing is a fragment shown in section by fig. 57, No. 1. It is a buff ware, blackened with soot. This piece shows a very slight projection inwards at the lip, and the curve from lip to shoulder is very shallow.

Amongst the debris which lay heaped up outside the entrance to the earth-house *h* were found several fragments of a large, coarse pot, other pieces of which had been found in 1932 adjacent to the hearth of the third occupation in Dwelling No. iii. The ware is heavy, dark

¹ In the National Museum in Stockholm there is preserved a vessel of identical form and character as that represented by the last-mentioned sherd, found at Sjögestad, Östergötland, with a third period *La Tène* fibula, which is regarded as dating between 200-150 B.C.

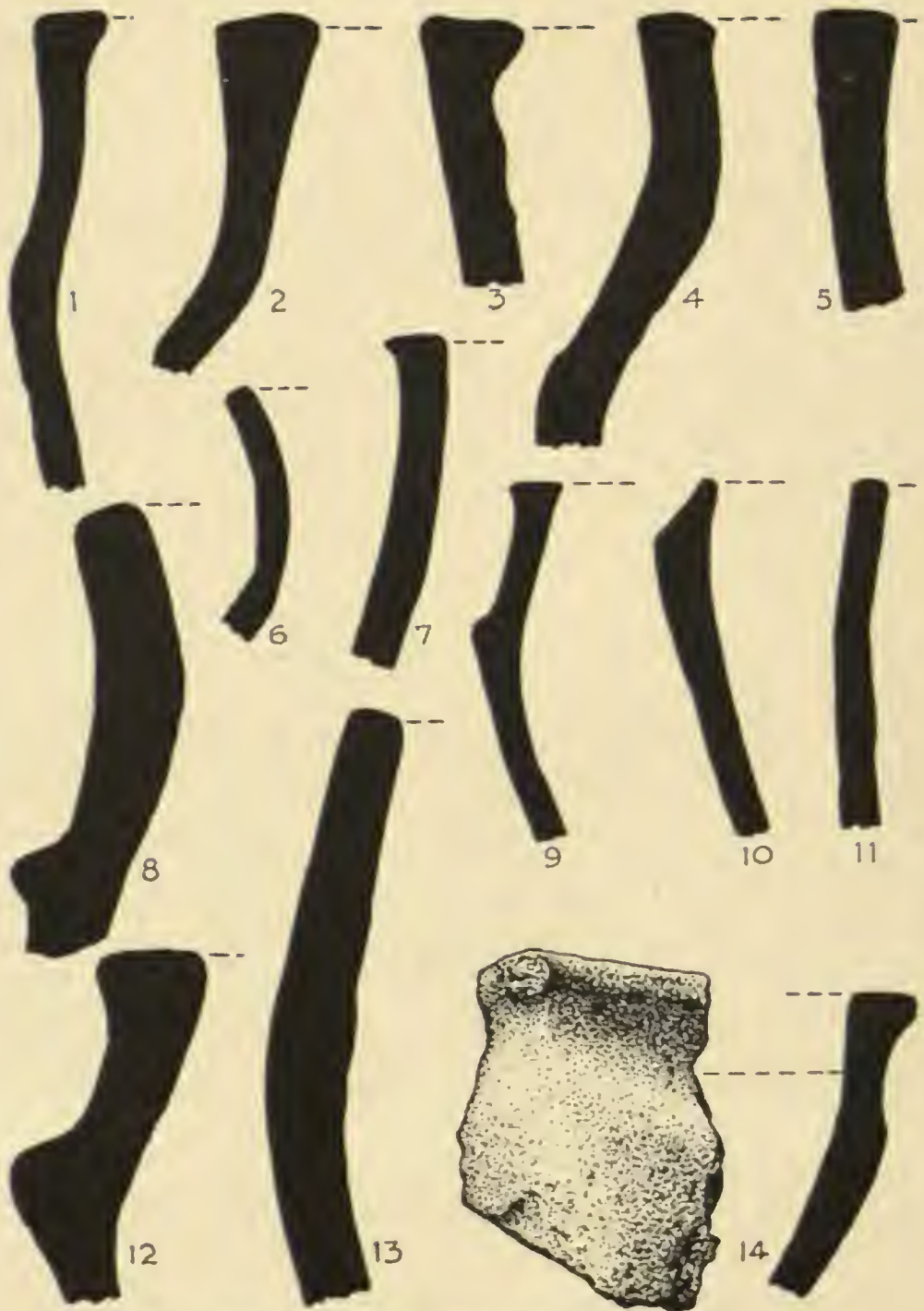


Fig. 57. Sections, etc. of Pottery from the Third and Latest Periods. (I.)

grey in tone, smooth on the exterior and very rough on the top of the rim and on the interior, with large protruding grains of steatite. A section is shown in fig. 55, No. 7.

Fig. 57, Nos. 8, 9, 10-12 and 14, fig. 58, No. 1, show also sections of other fragments referable to the third or latest occupation, it being impossible to differentiate between the relics of the last two. Fig. 57, No. 8, is of a fragment of a coarse reddish ware, with large grains of steatite in the body. It shows an estimated diameter at the mouth of 10 inches. Fig. 57, No. 9, is of a thin buff ware, blackened externally by fire. The plan of the rim suggests that this has been a part of a four-sided vessel. Fig. 57, No. 12, is of a coarse reddish ware. Fig. 57, No. 14, shown in elevation as well as in section, is apparently the corner of a four-sided pot of the same form as No. 9.

Fig. 57, No. 10, a black ware, polished externally, and No. 11, a fine buff ware, also fig. 58, No. 1, a heavy buff ware, were all found adjacent to the hearth in the centre of the dwelling and among the yellow peat ash. Their association with the third period is therefore also beyond doubt.

The following, shown in fig. 58, Nos. 2, 3, and 7, are sections of other sherds found beside a hearth in chamber c of this period. No. 2 is of buff ware with steatite in the body. No. 3 is of light red ware with many particles of steatite in the body. The surface has been rubbed smooth in the interior, and in certain pieces of similar ware from this level on the exterior as well. The ware seems to have been treated with a slip and is in some cases polished. The usual aspect of the interior from the polished chips of steatite, is grey. No. 7 is of a sherd, grey to black, rough on the interior from projecting grains of steatite, and blackened with soot on the exterior.

Fig. 58, No. 4, shows a section of a large vessel of coarse ware with a diameter of 12 inches, rough on the interior surface and coated on the exterior with a drab slip, the remains of which were found among peat ash on a slab adjacent to the furnace above described, which appeared to relate to the third period. The rim of the vessel was fashioned with a flange to the interior. Inside, at a depth of 4 to 5 inches below the rim, the wall was encrusted with carbon, and on the exterior was a black band 1 inch to 1½ inch in breadth just above that level, suggesting that the cooking-pot had been sunk in the ash when in use. The style of this rim corresponds with that of the second period, and as a number of similar fragments were found adjacent at a lower level it possibly dates from that period rather than from the third.

Fig. 58, No. 5, gives a section of a rim from the floor-level of f. The sherd is black and polished on the exterior, and pierced with a hole for a rivet below the lip.

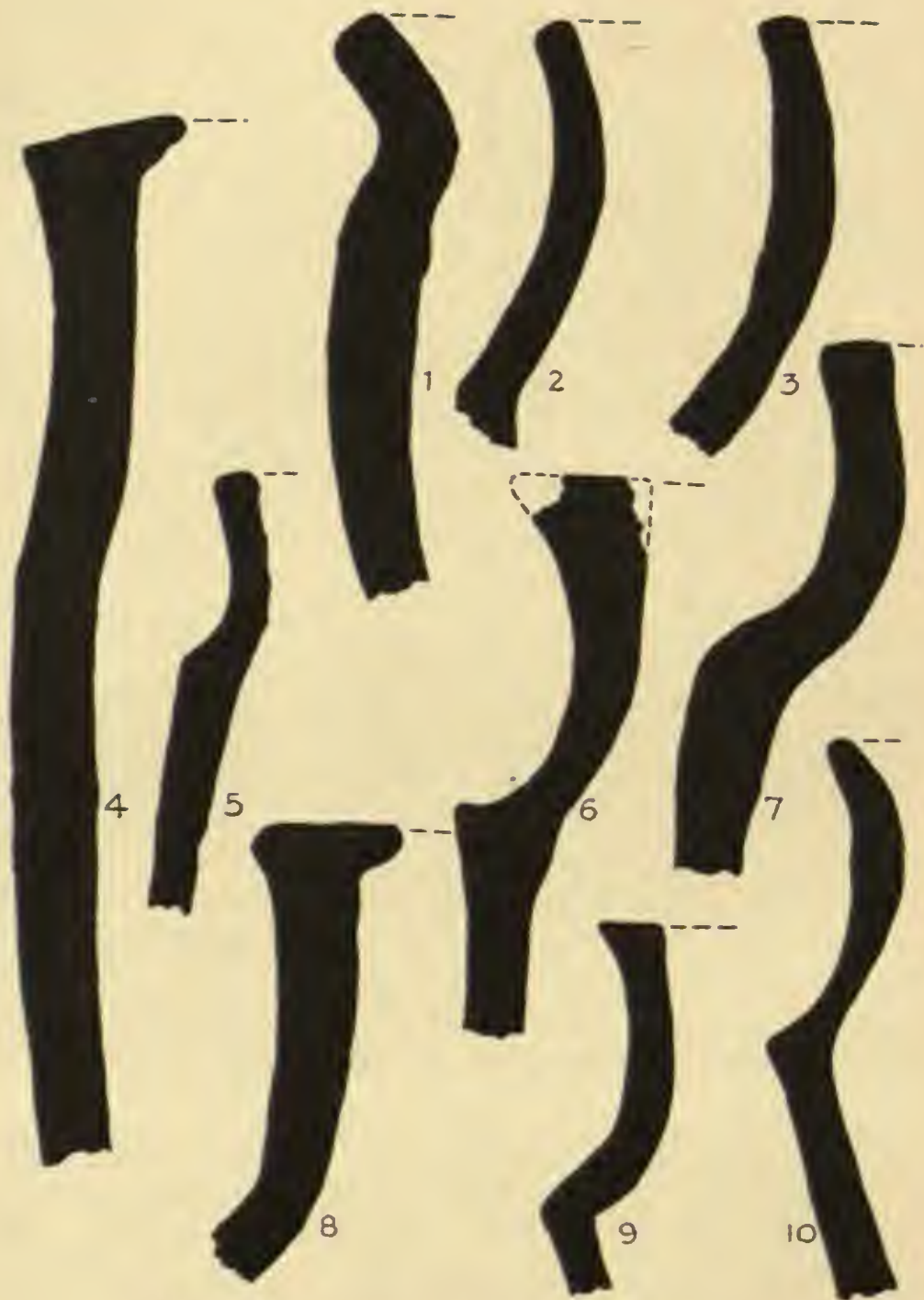


Fig. 58. Sections of Pottery of the Third and Latest Periods. (f.)

Fig. 58, No. 6, is a section of a rim from the floor of chamber *e* of the late occupation. The ware is buff on the exterior, coated seemingly with a slip over a dark grey body containing many grains of steatite. That chamber had evidently been abandoned some time before the occupation of the adjacent chambers *e* and *f*, as its floor-level was lower (16.03 feet above Ordnance Datum, while the corresponding levels of *e* and *f* were 16.55 and 16.89 feet respectively). Pottery from *e* might therefore be of a slightly earlier date.

Fig. 58, No. 8, is of a sherd found in the vicinity of the last mentioned at a level 16.03 feet over Ordnance Datum, which corresponds with the floor-level of *e* above mentioned. The pot appears to have been polished on the exterior and probably coated with a slip. There is a flange on the inner side, and there has been a deep cavetto on the exterior. Fig. 58, No. 10, is of a sherd from the same level with a cavetto and a well-defined shoulder. The ware has numerous chips of steatite in the body. Fig. 58, No. 9, gives a section of pot found on removing the latest peat-ash deposit from the interior of Dwelling No. iii, therefore of the third period.

The pottery recovered from Dwelling No. iii was considerable in amount, and it was remarkable that though odd pieces of rim were fairly numerable, portions of base were comparatively scarce, while in rare instances only did contiguous fragments come to light. These circumstances suggest the question whether discarded and broken pieces of pot were not crushed down for the purpose of supplying grit for the body of fresh pottery. It is extremely probable that one of the industries carried on in the dwelling was the manufacture of pottery, and in addition to finding a film of clay on the surfaces of two of the large querns at a point referable to the second period of occupation, below the slabs that lay on the floor of chamber *f*, there was found a bed of reddish-coloured clay, immixed with particles of steatite, and with a small piece of pot pressed into the surface. In the neighbourhood of this material were found two pieces of hematite, possibly used for coating the exterior of the pots to be finished with a polished black surface, before firing, though it appears to have been possible to obtain the black colouring merely by regulating the firing.¹ The method employed in the manufacture of the pots is well illustrated in a segment found of a body of coarse material showing that from a basal shallow bowl the vessel has been built up in a series of zones, each finished upwards to a fine edge, against and above which the next zone is formed. The employment of this method is illustrated also in Bronze Age urns in the National Museum.

¹ See Bye, *Jernalderen's Keramik i Norge*, pp. 211 *et seq.*



Fig. 50. Sections of Pottery from other sites than Dwelling No. III. (f.)

Only three rims were found in chamber *j*, which is situated to the south of Dwelling No. iii. The character of the enclosing walls showed that for the most part they had been built against material which had been employed to fill in the chamber. That this had been done at an early date was evidenced from the finding of a piece of sword mould at a fairly high level, 2 feet 3 inches below the surface. The pottery shows that this filling was done, probably, when the occupation of Dwelling No. iii was commenced. Fig. 59, No. 1, and fig. 53, Nos. 1 and 2, show sections of the rims recovered. Fig. 59, No. 1, is of a sherd of black ware with a bead moulding at $\frac{1}{2}$ inch below the rim. The pot has been roughly made, with no stentite visible in the body, and has had an estimated diameter of over 12 inches. Fig. 53, No. 1, is of a sherd of hard, heavy, reddish pot with a smooth surface and sharp grit in the body. The pot has had an estimated diameter of $7\frac{1}{2}$ inches. Fig. 53, No. 2, is of a sherd of hard, light red pot, very smooth on the exterior and with no stentite in the body. It has had a diameter of about 10 inches.

From the incomplete remains of chamber *k* in the lower levels came rims of class 1 (fig. 59, Nos. 2 and 3).

Many rims were recovered from Dwelling No. iv. Fig. 59, Nos. 4, 6, 7, 9, 10, and 12, show a selection of these. On the whole they appear to approximate more to the second period of occupation of Dwelling No. iii than to the third. No. 5 shows a close parallel to a sherd (fig. 59, No. 16) referable to the second period of Dwelling No. iii.

Nos. 6, 7, and 9 were all found at a high level and are probably late, but Nos. 10 and 12, at 13 to 13.40 feet over Ordnance Datum, were below the level of the floor at which the excavation of Dwelling No. iv has been concluded, viz. 14.27 feet.

Midden A was obviously connected with the early occupations of Dwelling No. iii, as during the third period the passage giving access to it from that direction was closed, and, as already stated, the pottery from it is of the early form.

The pottery from Midden B, rims and a base from which are shown in section in fig. 59, Nos. 8, 14, and 15, also indicate an early date in the history of the site for this midden.

The rims from Midden C, which from its depth appeared to be the earliest of the group of middens, are illustrated in fig. 53, Nos. 7 and 8, and fig. 54, Nos. 2 and 3. The pottery is of a drab or a reddish tone, hard, with specks of mica showing on the surface, and no stentite in the body. This is a similar pot to that recovered from the area east of Midden A, and indicates that Midden C belonged to the period of the erection of Dwelling No. iii.

Numerous rims conforming to one or other of the types previously

mentioned were found in exploring areas in the vicinity of the dwellings and middens, but call on the whole for no comment. One small fragment, however, found to the south of chamber *j*, shown in section in fig. 59, No. 13, is noteworthy for the delicacy of the pottery. It is a fine grey ware, and was associated with fragments suggesting a connection with the second occupation of Dwelling No. iii.

In clearing soil to the north-east of Dwelling No. i at 2 feet below the turf, on the surface of a paving of large flags, such as is frequently met with over the area, was found a heap of food refuse, including fish bones, among which was a sherd of coarse black ware with finger impressions beneath the rim (fig. 60), more akin to the craggan pottery of the Western Isles than to that of the earlier occupations of this site. A single rim fragment of a hard buff ware (fig. 59, No. 11) found at the north-west edge of the excavation shows a characteristic type of the twelfth or thirteenth century of our era.

In conclusion, the following facts emerge from the above review of the pottery. The pottery of the period previous to the erection of Dwelling No. iii, and of the first period of occupation of that dwelling, is of the same character—hard, well-potted ware, usually baked to a brick red, with grains of mica showing on the surface, and an absence of stentite in the body. Clay moulds for swords, etc., of bronze were associated with it in both periods. The pottery of the second period in Dwelling No. iii shows a marked change in form and technique. Rims with flanges to the interior, and profiles with a shoulder and cavetto below the lip, and a body backed with stentite, make their appearance. There is still in Dwelling No. iii the association of the clay moulds. In Dwelling No. iv, however, the flanged rims occur without the association of either the shouldered cavetto form or the clay moulds; the inference being that Dwelling No. iv had a temporary occupation while only the former type of pot was in vogue. The pottery of the third period in Dwelling No. iii continues the shouldered-cavetto forms that appear in the previous occupation, and points the line of the decadence of the form in rims where the cavetto has given place to a mere constriction below an everted rim with a bulging body beneath, *e.g.* fig. 58, No. 1, and fig. 60. With the pottery of the third period there is no association of clay moulds. The occupants have passed definitely into an Iron Age Culture. It is worth remarking that the pottery of the latest period is not in any way pottery characteristic of Broch Culture, only the sherd shown in fig. 60 bearing any resemblance to such characteristic ware. It approximates rather to some of the Hallstatic forms of the Continent,¹ and the British developments of All Cannings

¹ Déchelette, *Manuel d'Archéologie (Archéologie Celtique)*, vol. ii, fig. 320.

Cross¹ and Scarborough.² Both the last-named sites belonged to the latest period of the Bronze Culture, in that respect corresponding to Jarlshof in the earlier phases.

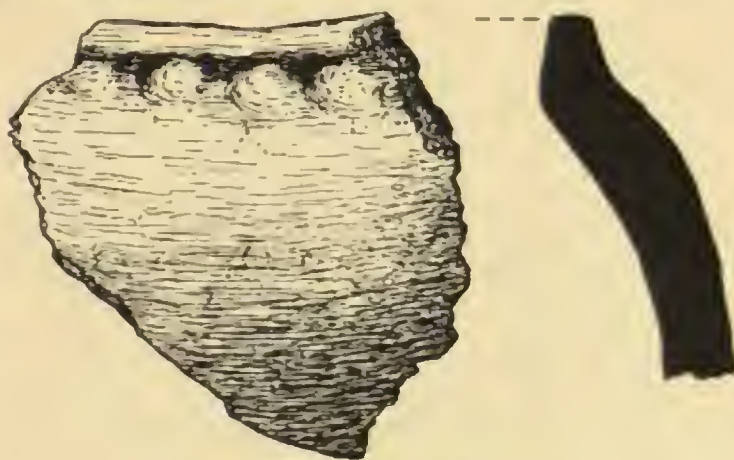


Fig. 60. Sherd of Late Ware. (†.)

POT LIDS.

Round discs of stone, obviously pot lids, were of fairly frequent occurrence, and two were found in position above the remains of crushed pots, leaving no doubt as to their purpose—one in Dwelling No. iii and the other in Dwelling No. iv. In addition to the discs square lids were also found, two in number, and their identity as such was fully established by the finding of sections of square pots.

POUNDERS.

Oblong pebbles, abraded at one or both ends, were found in considerable numbers, and eighty-four were recorded. They were hard beach pebbles, varying in length from 8 inches or thereby to 1½ inch (fig. 61, Nos. 1-3). Occasionally they were stones, beautifully marked or coloured, such as might possibly have been selected on account of these qualities. They were found throughout the various levels with a preponderance in those of later date. Frequently they occurred in groups, six or eight being found around the one situation.

PUMICE.

A large number of pieces of pumice were found, brought to the shores of Shetland by the ocean currents. Many pieces showed on their

¹ M. E. Cannington, *The Early Iron Age Inhabited Site at All Cannings Cross Farm*.

² *Archæologia*, 1927, vol. lxxvii, p. 191.



Fig. 61. Pounders of small size.



Fig. 62. Examples of Pumice showing marks of use.

surfaces the marks of use as an abrasive, sometimes in smooth polished surfaces, at others in grooves produced in the fashioning of bone pins, etc. (fig. 62, Nos. 1-5).

QUERNS.

In all, some eight large querns were found—five in Dwelling No. iii at various levels, and three broken and discarded examples in middens. From their vicinity were usually recovered the rubbing-stones, oblong pebbles with one slightly convex worked surface, which had been given a curve to fit the bed of the quern. The type of quern was the same wherever found, an oblong block of stone hollowed out like a trough but with one end open. Such querns may sometimes be termed "saddle querns" to distinguish them from "rotary querns," but the term is inapplicable, as in no aspect do they resemble saddles, and the name "trough querns" would be more descriptive. The largest specimen was found lying on the edge of Midden C. It measured 2 feet 9 inches in length, 1 foot 9 inches in breadth, and 1 foot 5 inches in greatest depth externally, while the basin, which was incomplete, a portion having been broken off, measured 2 feet in length by 1 foot 1 inch in breadth by 8 inches in depth. The rubber was found lying beside it. The earlier the period of occupation the heavier the querns appear to have been. A typical example may be seen in fig. 6.

SCRAPERS.

Twenty-six scrapers of quartz were found within Dwelling No. iii at the level of the first occupation only, while from the floor-level of chamber *p* came several lumps of the quartz matrix from which they were evidently being fashioned. Scrapers were found also in Middens A, B, and C, and in their vicinity. As previously related (p. 257), adjacent to Midden B there was found the site of a knapper's operations, with his hammer, anvils, and cores, also numerous chips and a few finished artefacts.

There was found, in addition to the foregoing scrapers of quartz, a single example fashioned from a flake of red flint, the only flint artefact so far found on the site. It came from Dwelling No. iii at the north end of chamber *b* among the remains of a broken-down slate box at a level of about 13 feet above Ordnance Datum.

Scrapers of quartz have also been found in Finmark in Norway.¹

A discoid object of slate (fig. 63, No. 4) found in the vicinity of Midden B had the appearance of having been subjected to use as a scraper.

¹ *Universitets Oldsamlings Skriften*, Oslo, 1929, Band ii. fig. 20, p. 31.



Fig. 83. Objects of Slate with Serrated Edges and a Slate Scraper. (No. 4.)

SHOVELS OF SLATE AND OTHER STONE.

Perforated heart-shaped objects, chiefly of slate, but occasionally of other stone, were represented by one complete specimen and ninety-nine pieces, a number of which amounted to a half. The probability is that these objects were used as shovels, or spades, with the hand inserted in the perforation, and the fingers bent so as to exercise a downward pressure, as signs of wear are frequently to be found on the lower side of the hole towards one side, where the friction from the hand, rather closely confined, would be most likely to occur. The fact that these objects are for the most part found just outside the dwellings and in the middens, and rarely within the dwellings, favours this suggestion for their use.

SLAG.

Slag.—Four specimens of slag were found in the course of the excavation.

(1) An iron slag without any copper in it, found in the lowest level of chamber *p* in Dwelling No. iii, and associated in locality with several large pieces of matrix-quartz, part of a scapula much worn by use as a shovel, two quern rubbers, and a pot rim. (Though the level is that of the first occupation the sherd contains much steatite in the body, which is not in keeping with the composition of the earliest pottery. The section, however, shows no late characteristic.) (2) An iron slag similar to the foregoing was found in the earth-house *h*. (3) A slag containing 22.04 per cent. of copper and 2.88 of lead found while opening up Dwelling No. iv. (It is noteworthy that no fragments of moulds were found as far as the excavation proceeded in this dwelling.) (4) A slag similar to the last, containing 10.56 per cent. of copper and 1.87 of lead, found in Midden B, associated in locality with pieces of clay moulds, slate implements, bone chisels, and a quartz scraper.¹

SLATE TOOLS.

Tools with Serrated Edges.—Twenty-six objects of clay-slate with serrated edges were recovered, and all apparently referable to early stages in the occupation of the area. From the interior of Dwelling No. iii came four pieces, viz. a small fragment from the floor of *l*, a fragment from the central area, found while removing the second occupation hearth, and two from the early chamber *o*. Only one of these is worthy of illustration, fig. 63, No. 2, which is one of the finest specimens so far obtained. Unfortunately it is imperfect—a part of the handle and of the back of the tool

¹ I am greatly indebted to Mr Cecil H. Desch, of the National Physical Laboratory, for having examined the specimens of slag and furnished me with a report on them.

having been broken off. It has been formed from a flake of slate rubbed down by pumice, and shows numerous striae on the surface. It is supplied



Fig. 64. Objects of Slate with Serrated Edges.

with a small flat projection at one end, possibly for attachment of a handle, as that feature is too small in itself to afford a satisfactory grip. Though no cultural association is suggested between these slate artefacts and the objects of similar material found in Norway, notched ends of

the same character appear on the Norwegian knives, *e.g.* on Nos. 5116 and 7468 of the National Collection at Oslo.

From the floor of *j* one piece was recovered (fig. 63, No. 9). From the area to the south of chamber *j* came two imperfect examples (fig. 63, Nos. 7 and 8). Two specimens, each with a notch at the end, came from chamber *k* (fig. 63, No. 3, and fig. 64, No. 3). One piece came from Midden A; three from Midden B (fig. 63, No. 7, and fig. 64, Nos. 5 and 8), one of them an obvious point, and one a handled butt; one from Midden C (fig. 63, No. 6); and from a low level in Dwelling No. iv came one (fig. 63, No. 5), a point end. From the various indefinite areas in the neighbourhood of the middens eleven were recovered, of which five are shown in fig. 63, No. 1, and fig. 64, Nos. 1, 4, 6, and 7. All the latter have probably been handled tools. The serrations on fig. 64, No. 4, are worn away.

It is difficult to determine to what use these serrated tools were put. It has previously been suggested, on the analogy of certain flint tools, that some may have been employed as sickles.

Where wood was so scarce as hardly to be of any account in the economy of the settlement, it is unlikely that so many saws were fashioned for sawing it, let alone the fact that slate would not be a good material to use for such a purpose. A saw appears to have been employed for cutting the cannon bones to make chisels from them. Further purposes for their use may have been the finishing off of the surface of pots before they were fired, and the skinning of carcases.

Knife-like Tools.—Tools of slate with their surfaces abraded with pumice, but with their edges unserrated, were of less frequent occurrence than saw-edged tools. They seem to have been more frequently fashioned with handles, and the levels at which they occur are also those of earlier occupation.

Five examples came from Dwelling No. iii.

One (fig. 65, No. 8) was found in the lowest level of chamber *o*, and is made with a notched tang at one end as if for attachment to a handle, in a manner similar to the Norwegian examples referred to previously.

A second (fig. 65, No. 7) came from below the second occupation hearth. It appears also to have had a tang or handle. Another specimen from this site is a mere point, which was found at the bottom of the hearth of the second occupation. Two other imperfect specimens (fig. 65, Nos. 3 and 6) were found below the second occupation level in *p*. One of these, No. 3, is fashioned with a handle. Fig. 65, Nos. 1, 2, 4, 5, show other handled specimens, all found in the area to the west and north-west of Dwelling No. iii.

These objects were also possibly used in the manufacture of pottery.

STEATITE VESSELS.

Although no complete vessel of steatite was recovered fragments came from all levels.

STONE IMPLEMENTS.

Roughly fashioned stone implements, for the most part peculiar to Shetland, were found in great numbers on every site, and almost entirely associated with the earlier occupations. A few were found in Dwelling



Fig. 65. Knife-like Tools of Slate.

No. iv, but these also on a low level. As the specific purposes of these tools or implements are unknown, and as they do not group themselves into well-defined forms, it is considered best not to classify them particularly. In all, from Dwellings Nos. ii, iii, iv, the middens, and their immediate environment, there came, exclusive of the so-called saws and knives, 329 artefacts made from slate or stone. With the limited accommodation

at the disposal in the Museum of Antiquities it was not desirable to bring this mass of material south, so sample specimens showing the different leading forms were brought to Edinburgh and are illustrated in fig. 66, Nos. 1-11.

From Dwelling No. ii and its immediate vicinity came 48 specimens. There was one good example of a club with a fashioned grip and several broken pieces of other club-like implements of sandstone. The majority were flat oblong implements of slate, such as might have been used in the manipulation of clay, of which so much was found on the site; and the fact that one was actually recovered with clay upon it lends colour to this suggestion. The form is illustrated by fig. 66, No. 1. A number of these slate tools from this site showed a peculiar shape, terminating at one end in a curve like the bow of a ship (fig. 67). This form did not seem to occur on the later sites. Implements with serrated edges and knife-like tools were conspicuously absent.

On the lowest level of Dwelling No. iii, upon the floor of chamber *l* (as previously stated), a remarkable collection was found (over 40 in number), associated with large unwrought pebbles, as if there had been a manufactory of tools on the spot, and fragments of sword moulds. A number of these specimens were imperfect, or merely broken fragments, and may have been remains of implements broken in the making, or material about to be remade. Among the few other specimens found in Dwelling No. iii was a fine-handled club-like implement (fig. 66, No. 11), found on removing the second occupation hearth. The majority of these objects were found in the middens, and in the unoccupied areas in their vicinity—no less than 73 coming from Midden C, and 18 from Midden D the earliest of the series of middens. Heavy club-like implements, with or without a grip, measuring as much as 14 inches in length, were fairly common, and there was also represented a heavy, curved, pick-like tool (fig. 66, No. 6). Flat oblong implements, sometimes pointed to one end, were most numerous (fig. 66, Nos. 1, 4, 7, and 9), and one of these, at least (No. 7), shows a depression on one edge as if to rest the thumb in while the implement was held so as to strike with the edge.

A certain number of handled tools were found (fig. 68, Nos. 1-3), and also the broken handles of others.

The purposes for which these tools and implements were used can best be determined by considering the requirements of the dwellers in the settlement. In a region in which timber was almost entirely lacking there was little need for sharp-edged tools such as a woodworker requires, and the necessities of the inhabitants would no doubt be met with cheaper material than bronze, while that metal was scarce and costly on the mainland. Slate, which was ready to hand in an outcrop at



Fig. 66. Roughly-fashioned Stone Implements.

Grootness on the other side of the isthmus, served the purpose. For extracting the slate, quarrying tools were required, and for this purpose the club- and pick-like implements would suffice. To fashion the slates lighter stone implements, such as are shown in fig. 68, would be needed. The hammer-stone found on the site of the quartz-knapper's operations (fig. 29) shows the class of implement that was employed for that purpose, the indentations on the tapered end indicating that it was held by the butt. Some of the tools were no doubt used for quarrying and fashioning steatite. Much use was made of this material, both for vessels, of which numerous fragments have been found at all levels, and also for supplying grit to be mixed with the potters' clay.

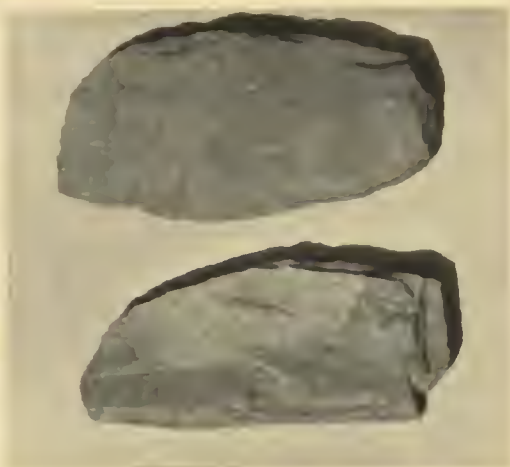


Fig. 67. Tools terminating in a Curve. (4.)

Near Cummingsburgh, on the banks of the Catpund Burn at the roadside, may be seen the outcrop from which the material has been quarried, and, *in situ*, a block, shaped for a bowl-like vessel, partially cut out and not detached from the rock. Steatite was largely used by the American Indians for cooking utensils on account of its fire-resisting properties, and its extraction from quarries was effected in exactly the same manner as in Shetland. For this purpose chisel-like tools of several varieties made of tough stone were employed, in appearance closely resembling some of the stone implements with which we are dealing.¹

Tools for working clay have already been referred to, and as working in clay was evidently a large part of the industry of the township, many of the flat tools were no doubt used for extracting clay as well as for working it in the manner of the mason's trowel.

The discovery of grain in Dwelling No. i² was proof of the practice of agriculture. Pointed tools much worn at the point, such as Nos. 3 and 5, fig. 66, might well have been used for working in the soil.

The finding of large lumps of matrix quartz shows that that mineral was obtained from the rock rather than from pebbles, as it probably was more readily fractured in the former case. This would supply another demand for heavy quarrying tools.

It has been said that heavy clubs, such as found in prehistoric

¹ Bureau of American Ethnology, *Bulletin* 60, pt. I, p. 228.

² *Proceedings*, vol. LXVI, p. 118.

environment, were employed for removing blubber from whales in comparatively recent times. While it is possible that they were so employed in earlier times also, the scarcity of whalebone, and the circumstances in which the clubs are found, do not afford plausibility to that explanation. Specialisation had not reached a fine point when such tools were in use, and a quarrying club would be as readily used



Fig. 68. Handled Tools.

for breaking rock and removing blubber as for pole-axing an ox or clubbing a seal.

Fig. 69 shows a curious object of stone, imperfect, which does not suggest use as a tool or implement. It is of sandstone, and was found at a level about 15 feet over Ordnance Datum on the east side of the interior of Dwelling No. iii. Presumably the object was originally symmetrical with two projections on each side, and so resembled a rudely shaped figurine. It has a peculiar interest in being one of the few relics from Jarlshof which has a parallel from Skara Brae in Orkney.¹

¹ *Proceedings*, vol. lxx. p. 71, fig. 30. The Abbé Breull has informed me that very similar objects are used as toys among the Tuosaraga in North Africa.

FURTHER EXCAVATION AT JARLSHOF, SHETLAND. 311

A small stemmed fan-shaped object of slate, $1\frac{1}{2}$ inch long (fig. 64, No. 2), which appears to have been the somewhat elaborate terminal of a handle, was found at a level 1381 feet over Ordnance Datum while searching for the wall-face of Dwelling No. iv.

WHORLS.

Only two whorls have so far been found on the site, and both near the same spot in Dwelling No. iii. Fig. 70. No. 1, is a thin irregularly circular disc fashioned from a piece of pottery, perforated eccentrically; and No. 2 is of steatite, with a large circular perforation made from both sides. Both specimens were found at a high level on the floor of chamber *f*.

GENERAL OBSERVATIONS.

Three dwellings have now been completely excavated at Jarlshof, and a fourth partially, so as to leave exposed a late level of occupation. Examination has also been made of various kitchen-middens.



Fig. 60. Stone Object resembling a Figurine.



Fig. 70. Spinning Whorls. (1.)

Dwelling No. ii, from the relative position of its floor, was the earliest. It produced no fragments of moulds for casting objects of bronze. One sherd of decorated pottery (fig. 3) was found in it, but that pottery is in no way characteristic of Bronze Age material.

Dwelling No. i showed two main periods. One disclosed in the larger part of the dwelling which extended from the original entrance eastward, and yielded numerous fragments of moulds for bronze swords and axes. The other in the lower levels of chambers G, H, and L, in which there were no fragments of moulds.

Dwelling No. iii disclosed three main periods of occupation, the two lower of which yielded numerous fragments of moulds, and the upper none. The pottery of the lowest level, however, differs markedly from that of the two later occupations, while no such distinction separates that of the other two. None of the pottery could be called characteristic Bronze Age pottery, and it is not surprising that a piece of iron slag should have been found at the level of the earliest occupation.

Dwelling No. iii was erected on the site of an earlier habitation, remains of which are chambers *j* and *k* and the passage *r*. The mass of debris between Dwellings Nos. iii and iv has been derived from this earlier construction, and contains numerous relics from it. The pottery found from these sources is akin to that of the first occupation of Dwelling No. iii.

Dwelling No. iv has been excavated partially so as to leave exposed late features similar to those which were removed from the higher level of Dwelling No. iii. There is no doubt that remains of earlier occupation lie beneath. The pottery from Dwelling No. iv indicates a connection with the second occupation of Dwelling No. iii, but there is an absence of moulds from it, a fact which suggests a later date.

The middens, as disclosed by the relics, are all referable to the earlier occupations.

The details of the latest construction do not correspond to those of the hrochs, nor does the pottery resemble characteristic broch pottery.

I cannot conclude without acknowledging the help of many friends. I am greatly indebted once more to Miss Margery I. Platt of the Royal Scottish Museum for the examination and report on the animal bones. From Mr James S. Richardson, Inspector of Ancient Monuments, I obtained valuable assistance in recovering the dog's skeleton and in making a measured drawing of it. For many weeks my son, Mr A. T. Curle, attended daily and washed the numerous relics as they were recovered from the soil. Major A. A. Gordon, C.B.E., also helped in a similar manner, while at the close of the season The Hon. J. M. Balfour took a share of the supervision. Nor must I omit to thank Major Gardner, F.R.I.A.S., who took considerable pains to make me a sketch of a crushed earthen pot with its stone lid upon it, which I was unfortunately unable to make use of as an illustration. Mr J. B. Mackay

of H.M. Office of Works, as in the previous year, afforded me much assistance and was resourceful on all occasions; Mr Baird, the official foreman of the Department, was invaluable; while the staff of local workmen showed, as heretofore, intelligence and enthusiasm in the execution of their work. Lastly, I have been indebted to Dr Graham Callander, the Director of the National Museum, and to Mr A. J. H. Edwards, the Assistant Keeper, for much help while this paper was in preparation and passing through the press.

REPORT ON THE ANIMAL BONES FROM JARLSHOF, SUMBURGH, SHETLAND. By MARGERY I. PLATT, M.Sc., Royal Scottish Museum, Edinburgh.

The animal remains obtained in the course of excavation at Jarlshof, Sumburgh, in 1933, resemble in kind those found in Dwellings No. i and No. ii in the previous year, and are quite typical of a Bronze or Early Iron Age settlement. Early domesticated or semi-tame animals of use for food, *e.g.* sheep, ox, and pig, are, of course, most abundant. Other species represented by more scanty remains may have been also utilised in this way. The various species are recorded below in order of their numerical predominance, so far as the mammals are concerned; other groups are of minor importance.

Sheep.

The bones of the sheep obtained last year occurred in varying proportions in different parts of the excavation. As on previous occasions they exceed in number those of any other domestic animal. Skulls, even of a fragmentary nature, are not numerous, and there is no indication of the presence of many varieties of sheep, as there was in previous years. In particular there are no remains of the typically small Shetland sheep, or of the hummel type. All the smaller bones apparently belong to immature sheep, judging by a lower jaw of comparatively large size, which has not the adult dentition. There are, however, a few horn-cores and odd limb bones indicating a sheep of unusually large and slender build. These were obtained in parts of the excavation of early date, *e.g.* from the passage known as the "South Corridor" between Dwellings No. iii and No. iv and Midden C. Therefore, in the absence of skulls of varying adult type, it may be safely assumed that the numerous smaller bones represent early growth stages of a heavy-horned, large-limbed, yet slender sheep, which is the only type present. The large horn-cores are reminiscent of those of the Soay sheep. Where horn-cores remain attached to a fragment of skull, these are seen to diverge from one

another at an angle of about 105° ; sweeping in a wide gentle curve slightly upwards, but chiefly outwards and backwards. There is a prominent ridge on the upper surface along the whole length of the core, and a second on the under surface; anterior to these the core is rounded, but flattened posteriorly. Hence, at any point the core is semicircular in section, with the flattened surface posterior. The surface texture is smooth and finely pitted. The cores do not appear to have been so long as those of the Soay sheep, but since all the specimens from Sumburgh are broken and incomplete at the end, it is impossible to state their original length. Nevertheless, in their solidarity, massive size, angular shape, and surface texture they resemble the horn-cores of the Soay. A few other bones of this large variety of sheep from this excavation have been preserved, fortunately whole or nearly complete, so as to admit of measurement and allow of interesting comparison with the corresponding bones of the Soay skeleton in the Royal Scottish Museum. It will be seen from the measurements recorded below that the cannon bones compare very closely, the Sumburgh bones being actually slightly longer than those of the Soay species, yet the former are even more slender, as shown by the shaft measurement:

	Sumburgh.	Soay (R.S.M.).
<i>Melacarpal:</i>		
Max. length	13.0 cms.	12.75 cms.
Max. width of proximal end	2.4 ..	2.4 ..
Max. width of distal end	2.55 ..	2.5 ..
Min. width of shaft	1.45 ..	1.6 ..
<i>Melatarsal:</i>		
Max. length	14.15 ..	13.8 ..
Max. width of proximal end	1.0 ..	2.0 ..
Max. width of distal end	2.2 ..	2.45 ..
Min. width of shaft	1.1 ..	1.25 ..
<i>Radius:</i>		
Max. length	14.35 ..	16.2 ..
Max. width of proximal end	2.85 ..	3.5 ..
Max. width of distal end	2.55 ..	3.1 ..
Min. width of shaft	1.5 ..	1.8 ..
<i>Tibia:</i>		
Max. length	21.1 ..	22.4 ..
Max. width of proximal end	3.8 ..	4.3 ..
Max. width of distal end	2.45 ..	2.75 ..
Min. width of shaft	1.4 ..	1.65 ..
<i>Humerus:</i>		
Max. length	* (11.8 ..)	15.5 ..
Max. width of proximal end . . . .	...	4.25 ..
Max. width of distal end	3.0 ..	3.35 ..
Min. width of shaft	1.4 ..	1.75 ..

* The figure in brackets is the length of a fragmentary bone.

FURTHER EXCAVATION AT JARLSHOF, SHETLAND. 315

	Sumburgh.	Soay (R.S.M.).
<i>Femur:</i>		
Max. length	(16.1 cms.)	19.0 cms.
Max. width of proximal end	4.3 ..	4.85 ..
Max. width of distal end . . . . .	...	4.15 ..
Min. width of shaft	1.4 ..	1.65 ..

Skulls and lower jaws are either immature or, if adult, badly broken. Measurements of a few of the fragmentary horn-cores are recorded below for comparison with those of the Soay sheep:

		Sumburgh.		Soay (R.S.M.).
<i>Horn-cores:</i>	S. Corridor.	Midden C.	Midden E.	
Outside length of curve	(16.8 cms.)	(19.5 cms.)	(18 cms.)	32 cms.
Girth at base	13.8 ..	18.0 ..	16 ..	17.8 ..
Distance between bases	3.4 ..	...	...	3.3 ..

These measurements, few as they are, point to the presence of a sheep greatly resembling the Soay, heavy-horned and with long slender limbs of even more deer-like proportion. With few exceptions the bones of immature animals only are found in the middens. Many bones show teeth marks and evidence of gnawing, this being an indication in itself that dogs were kept, a fact of which there is further verification in the discovery of a complete dog's skeleton, to be described later.

Oc.

Bones of the ox from Sumburgh this year are quite numerous, but do not represent so many individuals as those of the sheep. There are also more young animals represented than adults, although it is always difficult to judge the number of adults since their bones are invariably more broken up. The large fragments probably are all that remain of bones which have yielded a good supply of marrow. Every bone of the skeleton may be recognised in whole or in part—small ones such as carpals, tarsals, and phalanx bones have escaped damage and are particularly numerous. Measurements have been taken of a few complete bones for comparison with those of the small Shetland ox and are recorded below:

	Sumburgh.		Shetland (R.S.M.).
<i>Metacarpals:</i>	A.	B.	
Max. length	18.3 cms.	17.5 cms.	17.5 cms.
Max. width of proximal end	5.2 ..	5.4 ..	5.25 ..
Max. width of distal end	5.3 ..	5.5 ..	5.55 ..
Min. width of shaft	2.05 ..	2.8 ..	2.65 ..

	Sumburgh.		Shetland (R.S.M.).
<i>Humerus:</i>	A.	B.	
Max. length	32.5 cms.	...	26.5 cms.
Max. width of proximal end	11.05 ..	...	8.75 ..
Max. width of distal end .	8.9 ..	...	6.7 ..
Min. width of shaft . . .	3.05 ..	...	3.05 ..
<i>Atlas vertebra:</i>			
Length of centrum . . .	4.0 ..	3.95 cms.	3.8 ..

It is unfortunate that there is not more complete material for measurement and comparison, but from the evidence it is apparent that the Sumburgh oxen are not far removed from the typically small Shetland race of oxen found in the island to-day. The cannon bones are almost identical, whereas two humeri are only slightly longer though more slender of shaft than those of the small Shetland ox. These early oxen were probably slightly taller with more slender limbs. No skulls were found, and only an occasional lower jaw with remains of a milk dentition. The few horn-cores found point to a shorthorn type. They are small, heavy, and cornute, rapidly becoming pointed distally. Their girth at the basal point of origin is roughly equal to the length of the outer curvature, as seen below:

	Sumburgh.	
<i>Horn-cores:</i>	A.	B.
Length of outer curvature	14.75 cms.	15.9 cms.
Circumference of base	14.75 ..	15.3 ..

The ox bones appeared in quantity in all parts of the excavation, except in the "South Corridor," where they were only sparsely represented. There is no indication of an ox of larger breed, the small-sized ox of rather slender build being evidently the only kind present.

Pig.

As in previous years remains of pig are much less numerous than those of sheep and ox. Very young or small-sized pig remains were found dispersed in different parts of the excavation; yet only a few fragments of skulls, lower jaws, and metatarsal bones are representative of adult animals. The bones appeared sparsely everywhere except at the very lowest levels, in *h* and in the uppermost layers, i.e. the surface of Dwelling No. iii. Many of the lower jaws had milk molars present and the last molars not fully grown. One fragment of skull from earth-house *h* contained an adult tooth row showing wearing of the last molar tooth. This furnishes a slight difference from the domestic variety of to-day, in which the last molar is not usually so worn. The total length of the upper tooth row as taken from this last fragment

is 10.35 cms. In another similar adult skull fragment from the "South Corridor," the tooth row measures 9.9 cms. Neither of these indicate pigs of very great size.

Pony.

With the exception of one bone—a phalanx of small size—the pony is not represented this year. This is rather surprising, since remains of pony were thinly scattered throughout all parts of Dwelling No. i excavated in 1932.

Dog.

Under this heading is recorded the most important animal find of the year, *i.e.* the almost complete skeleton of a dog. Its association with these early dwellings makes it of late Bronze Age, or Early Iron Age date, and as such it is certainly the earliest and most primitive dog so far found in Scotland. Its position was quite natural, and gave no suggestion of disturbance of the remains since the animal lay down and expired at the entrance to Midden B. The dog was about 18 inches high at the shoulder and resembled in other proportions a terrier. The maximum length of the skull is 175 mm., and though slightly larger, compares closely in most respects with a dog's skull (preserved in the British Museum) from the Swiss Lake Dwellings. The Sumburgh dog differs mostly from these early Swiss Lake Dwelling dogs in the markedly greater width of the cheek-bones. In this respect it differs also from most other dogs of early date, *e.g.* those of Early Stone Age figured by Rüttimeyer¹ and Bronze Age dogs, as recorded by Degerböl,² on the Continent. The only specimen which resembles the Sumburgh dog in its proportional width of cheek-bones is the skull of a larger dog in the British Museum labelled "*Canis familiaris*, Early Iron Age, from Hauging Langford Camp, Wilts." However, in its smaller size and general features the Sumburgh dog's skull appears to be much more closely related to the Stone Age type (*Canis palustris*) than to the larger species typical of the Bronze Age (*Canis inostranzewi*).³

Seal.

Remains of the Grey Seal (*Halichoerus grypus*) were very sparsely distributed in all parts of the excavation. A few lower jaws, claws, leg-bones, and vertebrae of adult size occurred in Midden A, also in i and earth-house h associated with Dwelling No. iii. Bones of the young of this species occurred. The common seal (*Phoca vitulina*) was not represented.

¹ "Die Fauna der Pfahlbauten in der Schweiz," von Dr L. Rüttimeyer, *Nouveaux Mem. de la Soc. Helvétique*, vol. 19 (1921).

² "Über prähistorische, dänische Hunde," von Magnus Degerböl, *Publikationer fra Universitetets Zoologiske Museum, København*.

³ A separate and more detailed report of the entire skeleton will be shortly submitted for publication to the Royal Society of Edinburgh.

Whale.

In Middens B and C and in earth-house *h* a few fragmentary remains of whale of unknown species occurred. These included parts of vertebra, a first rib, and part of a lower jaw.

Field Mouse.

The skull and limb bones of a Field Mouse (*Apodemus sylvaticus*) were found in earth-house *h*. Since these small animals burrow extensively to-day, their remains are not of prehistoric interest.

Birds.

The remains of these are thinly scattered in most parts of the excavation. In Dwelling No. iii and its associated earth-houses odd bones of the Eagle, Falcon, Gannet, Skua, Cormorant, Shag, and Lapwing occur; while in Middens A and B. Cormorant, Gannet, Shag, and Goose are represented. Of these remains those of the Gannet are the most numerous.

Fish.

Very few fish bones were found this year, some in Dwelling No. iii, others in earth-house *h*. Only two species are represented—the Cod and the Wrasse—parts of the skull and teeth or vertebra of these only being found.

Shells.

Shells of the Limpet (*Patella vulgata*) were very numerous in the middens. Those of the spout-fish (*Ensis ensis*) were only found in one midden preserved beneath a stone, elsewhere they had entirely disintegrated.

Sponge.

In the corner of chamber *p*, Dwelling No. iii, a curious light grey substance was found, resembling a piece of cotton-wool or some kind of fabric. This, on microscopic examination, was found to be composed of tiny glassy monaxon spicules, proving it to be the remains of a specimen of the Bread-crumble Sponge (*Halichondria panicea*) found commonly in the shallow waters round our coasts. Its presence within the dwelling at Jarlshof is puzzling, as it must have been brought by human agency to the spot where it was found. Such glassy sponges from time to time have been used for only two purposes by man: firstly, as fertilisers, and secondly, in lieu of cosmetics. It is highly improbable that the inhabitants of the dwellings at Jarlshof should have been aware of their former use, and very remarkable should they have employed the material for the

latter. I am indebted to Mr M. Burton, M.Sc., of the British Museum, for the information that some primitive people make use of glassy sponges in place of cosmetics. The practice of using freshwater sponges for this purpose has been attributed to the early Russian people. The minute glassy spicules of the sponge rubbed on to the skin cause slight irritation, and produce in consequence a natural bloom. From an isolated instance of a discovery of this kind it is unwise to draw conclusions.

Human.

Among the remains of Dwelling No. iv, very early in date, occurs the parietal bone of a human skull. Miss M. L. Tildesley of the Royal College of Surgeons kindly examined this for me. She suggests it possibly belonged to a man under thirty-five years of age, having a broad-headed type of skull. This latter type is quite in agreement with a Bronze Age date.

Derived as they are from the middens of an early dwelling, the bones are of a fragmentary nature, as would be expected: the extent of this has been noted already under the various sub-headings. Apart from the unique find of the dog's skeleton, the sheep remains create perhaps the greatest interest this year. More curious even than the lack of variety found last year is the apparent absence of the small Shetland breed. This typical remnant of an early domestic variety—the Pent or Turbary sheep—which has always been regarded as having had especial preservation in Shetland from an early date. So far as evidence goes, and providing that the Dwellings exposed this year are earlier in date than those of last, it is a sheep having affinities with the other primitive domestic breed—the Soay—which has gained priority in Shetland. This is quite consistent with the fact that this large-horned early domestic race (according to Professor Ritchie¹) was widely spread in Europe in the Bronze Age. The question as to which of these two early breeds was the first to inhabit Shetland may be answered as the result of further excavation, and, following from this, the subsequent history of the various breeds of sheep in these islands.

An interesting agreement with early excavations in Denmark is the presence of bones of the Grey Seal (*Halicherus grypus*)—rather than those of the Spotted Seal (*Phoca vitulina*) most common to-day. The latter species, according to Degerböl,² was rarely present in seas of the Early Stone Age, having apparently become increasingly more common as time has gone on.

¹ J. Ritchie, M.A., D.Sc. (1920), *Animal Life in Scotland*.

² Magnus Degerböl, København (1923), *Danmarks Pattedyr i Fortiden*.

IV.

A LONG STALLED CHAMBERED CAIRN OR MAUSOLEUM (ROUSAY TYPE) NEAR MIDHOWE, ROUSAY, ORKNEY. By J. GRAHAM CALLANDER, LL.D., F.S.A.SCOT., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND, AND WALTER G. GRANT, F.S.A.SCOT. WITH A DESCRIPTION OF THE SKELETAL REMAINS, BY PROFESSOR ALEX. LOW, M.A., M.D., F.S.A.SCOT.

On the south-west coast of the island of Rousay, Orkney, about 100 yards south-south-east of the broch of Midhowe, is an oblong grass-covered mound which lies roughly parallel to, and about 22 yards distant from, the seashore (fig. 1).¹ Before excavation it measured about 100 feet in length and about 30 feet in breadth, its main axis running 11° west of north magnetic, nearly north-north-west and south-south-east. The top stands about 9 feet high and some 35 feet above high-water mark. On the landward side the mound merges gently into the adjoining field, which rises in a gradually steepening ascent towards Mansemass Hill; on the side towards the sea the ground falls away in a slight slope to the edge of a low cliff. Apart from its shape, which formerly was partly obscured by a dry-stone dyke running along its crest, the only indications that it was artificial were the tops of a row of stones peeping through the turf in a straight line near its western margin. To ascertain the character of the monument a short length of this line of stones was laid bare and a shallow trench driven across the mound as far as the dyke on the top. These excavations disclosed a cairn of stones with a wall-face on the outside and with chambers inside. For about a quarter of the length of the mound the wall-face, which runs in a straight line, was laid bare as far as the south-western corner. This corner was square, the southern end being built at right angles to the

¹ When Mr Grant decided to excavate this site he asked Mr J. Hewat Craw to supervise and describe the operations. In July 1932 the entrance passage and the first three cells were examined, and some trial excavations were made at other parts to determine the limits of the structure within the mound. In July and August 1933 the remaining nine cells were explored, but Mr Craw had to return home before the work was completed, leaving Mr Grant and myself to finish it. Before his lamented death a few weeks later Mr Craw had drafted a preliminary report on the work of 1932, which, however, had to be recast in view of later discoveries. He had also kept very full working notes of the 1933 operations. Having followed the whole course of the excavations, we have been able to complete this account from the material left by Mr Craw and from our own observations. Mr Grant has now conveyed the custody of the monument to H.M. Office of Works.—J. G. C.

main axis of the cairn, while the south-eastern corner was rounded. A short section of the straight wall-face near the centre of the eastern side, and the curved northern end were also cleared, but not to the foundation.

No further excavation for the purpose of exposing the remaining part of this wall was undertaken in 1933, as it had been decided to hand over the monument to the custody of H.M. Office of Works, which Department, in the course of the operations necessary for its preservation, would uncover the entire periphery.¹ This work was carried out during



Fig. 1. Midhowe Chambered Cairn: View from south-west, showing Foundation of Outer Casing Wall and Face of Part of Inner Wall.

the present summer, when the remains of the face of an outer wall or casing were exposed at an average distance of 5 feet 6 inches, and 7 feet 9 inches outside the inner wall on the east and west sides, and 5 feet 9 inches and 4 feet 6 inches from it at the north and south ends, the intervening space being packed with small stones (fig. 2). As in the case of the inner wall, the outer one is practically straight at the sides and curved at the north end. The south end is similarly curved round the corners, while, as we have seen, the inner one is straight, except at the south-east corner. The extreme length of the building is 106 feet 9 inches and the breadth 42 feet 6 inches.

The height of the inner casing still standing, as exposed by the

¹ This work was done after the paper was read, but before it went to press.



Fig. 2. Midhowe Chambered Cairn: View of Outer Casing Wall (1) and Inner Wall (2).



Fig. 3. Midhowe Chambered Cairn: Outer Casing Wall, east side, and Chamber covered with corrugated iron pending preservation work.

Office of Works, varied from about 4 feet to nearly 5 feet on the east or landward side, and from $3\frac{1}{2}$ feet to 6 feet on the west, the central section on each side being best preserved. This face of walling was nearly vertical and the stones were, as in ordinary building, laid on the flat.

Along the greater part of the west side nothing remained of the outer casing wall except the displaced foundation courses (fig. 1), but nearing the north end it survived to a height of about 2 feet. Along the east side (fig. 3) and round the north end it showed remarkable structural features. There were two foundation courses, each formed



Fig. 1. Midhowe Chambered Cairn: Lower Part of Casing Wall where direction of slanting stones alters (1) and (2).

of slabs 4 inches to 5 inches thick, the lower projecting 3 inches to 4 inches outwards from the upper, which in its turn projected the same distance from the wall-face above it. These stepped foundation courses extended about three-quarters along the east side from the south corner, and were traced in places at the north end. In other parts the two foundation courses were laid flush. Above the foundation the stones in the face of the wall were set obliquely, their edges to the outside sloping downwards from left to right from the east side of the entrance passage round the south-east corner, and along the east side as far as the turn in the north-east corner. Here the direction of the stones was reversed, the slant downwards being from right to left (fig. 4). This latter arrangement was probably continued round the north end and along the west side and south end as far as the entrance passage, as portions of it remained in position at the first-mentioned place, and

between the south-west corner and the entrance. Above the oblique building was what might be called a string-course, formed by slabs laid flat. At the best-preserved part the height from the top of the foundation courses to the top of the string-course was about 2½ feet. On the upper side of the string-course was a scarcement about 5 inches wide, above which the face of the wall was continued upwards by stones, again built obliquely, but slanting in the opposite direction from those below, thus forming a sort of herring-bone pattern (fig. 5). Only a short length of the upper face remained, about half-way between the middle and



Fig. 5. Midhowe Chambered Cairn: Face of Casing Wall, showing lower (1) and upper (2) parts slanting in opposite directions, with string-course between.

north end of the monument, where it survived to a height of about 1 foot at most.

Very little of the outer casing remains at the south end, as so much of the building has been taken away that the face of the inner wall is exposed (figs. 6 and 7). All that survives of the outer face is about 6 feet on either side of the doorway of the entrance passage leading into the burial chamber. On the west side it is no more than 10 inches in height, and on the east about 2 feet, but it is reduced to the foundation courses by the time it reaches the south-east corner. The doorway has been carefully built up flush with the outer wall (fig. 7).

The entrance passage was originally 12 feet 9 inches in length, but the surviving portion from the face of the inner wall to where it enters the gallery is 8 feet 6 inches. It measures 3 feet 3 inches in width at the opening in the inner wall, slightly more at the centre, and 3 feet 1 inch

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at the inner end. Just before it enters the gallery two steps, each about 9 inches in height, lead downwards (fig. 8). The walls of the passage still



Fig. 6. Midhowe Chambered Cairn: South-east corner, showing Line of Outer Casing Wall (1) and of Inner Wall (2).



Fig. 7. Midhowe Chambered Cairn: South end, showing Entrance in Outer Wall blocked up.

rise to an average height of 2 feet 6 inches, but, as none of the lintels survive, the original height cannot be ascertained.

The burial chamber, completely filled with stones which had fallen in when the roof collapsed (fig. 9), is divided into twelve cells by large

upright flagstones, measuring from 3 inches to 9 inches in thickness, bonded into the lateral walls opposite each other and projecting towards the centre. As excavated, the interior of the building looks like a long narrow byre, with twelve stalls on each side, separated from one another by short trevisses of slabs (fig. 10 and Pl. V.). The well-built dry-stone



Fig. 8. Midhowe Chambered Cairn: View of Entrance from the Interior.

walls are vertical. At some points, indeed, in the cells near the entrance, appearances at first suggested that the roof had been corbelled inwards, but later on it became evident that the inward thrust had been produced after the collapse of the structure. The west wall of Cell No. 5 showed a distinct straight-jointed break, the significance of which is not obvious. It is just possible that the portion further north represents an after-thought, in the form of an extension of the chamber; but this is doubtful, as the break occurs near the centre of the cell. At its inner end the gallery is not closed by ordinary walling, but by a large slab, 3 feet

3 inches high, set on edge. The last cell, No. 12, is divided into two compartments by three low slabs, also set on edge. These form a partition that extends from wall to wall across the passage-way, and they are so arranged that the one in the centre overlaps the two at the sides. The inner compartment is paved with flags, and the west side of the outer is partitioned off with a slab set on edge.

The gallery measures 76 feet in length. As its lateral walls are not in exact alignment the cells are of varying breadth, the first four measuring about 6 feet 6 inches, those in the centre up to 8 feet, and those at the northern end about 7 feet 3 inches. The distance between the upright flags separating the cells ranges from 4 feet to 7 feet, and their inward projection from 1 foot 6 inches to 2 feet 4 inches, leaving an open space of from 3 feet to 4 feet in the centre between the inner ends of the opposite pairs. The two tallest of them are near the centre of the gallery, between Cell No. 6 and Cell No. 7, where the flag on the east is 7 feet 6 inches high and the flag opposite, on the west, 7 feet. The others diminish in height as they approach the ends of the structure. Those between the six southern cells range from 6 feet 9 inches to

4 feet 6 inches, the shortest being at the inside of the entrance passage. The tops of several of these have broken off naturally at an angle, and in the case of three on each side, the void so formed has been filled with stones laid on the flat to secure a more level surface. The slabs between the northern cells are more regular in height, the average being about 5 feet. They have been dressed in a most unusual fashion, their upper part having been smashed off with heavy blows of hammer-stones, struck downwards in a slanting direction and delivered first on the one side and then on the other. This is clearly seen in fig. 10.



Fig. 9. Midhowe Chambered Cairn: Debris from collapse of Roof.

The roof seems to have been lintelled. Probably slabs were placed longitudinally on the tops of the upright stones close to the side walls, and the intervening space in the middle covered with lintels laid transversely. Numerous flat stones that would have been suitable for this purpose were observed amongst the fallen debris with which the gallery



Fig. 10. Midhowe Chambered Cairn: View from north, showing tops of Slabs dressed off.

was choked. As in many of our other Scottish cairns, there would doubtless be a thick covering of stones, built on the top of the lintels to keep them in position when complete, before the monument became obscured by the natural accumulation of soil and decayed vegetation.

At the northern end of the cairn are the remains of what may have been an entrance passage (fig. 10), the bottom of which is about level with the top of the slab which forms the end of the chamber already described. On the west a wall, now 8 feet 3 inches long and 2 feet 3 inches high, slants slightly outwards towards the exterior, and the corresponding wall on the east has been destroyed save for a short length where it

joins the gallery. It has been suggested that this gave access to an upper chamber in the northern half of the cairn. As things are to-day, there would be little space between the floor and the roof of such a structure, but it is certain that the monument has been much despoiled and that it must originally have been very much higher. Seeing that barely four miles to the south-south-east on the same island, at Taiverso Tuick, there is a chambered cairn with two storeys, it may well be that the inner portion of the Midhowe cairn had likewise been two storeyed. The presence of a wall-head above the low divisional slab on the west side of the end cell, 3 feet 9 inches from the floor, and of a slight scarcement immediately adjoining it in the north-west corner of the cell, strengthen the claim for an upper storey at this part. The wall-head and scarcement are shown prominently on the right-hand side of the foreground of fig. 10.

From the south end of Cell No. 7 to the northern end of the gallery, at a height of about 5 feet 6 inches above the floor, on the east side, is a wall-head finished with a paving of thin slabs which extends back from the face of the wall from 12 inches to 2 feet 6 inches.¹ There is no corresponding feature in the first six cells nor on the west side of the gallery at any part. If we are right in our suggestion that there had been an upper storey in the inner half of the gallery, the height of the wall-head would fit in quite well with the floor of the upper chamber.

It is impossible to give any indication of the height of the suggested upper compartment, but when we see that the outer upright wall on the east side, even in its dilapidated condition, still rises 1 foot higher than the wall-head in the gallery, we may be sure that the central ridge of the roof, even though it sloped back from the wall in a gentle rise, would be a good many feet higher. Allowing the height of the outer wall above the scarcement to have been the same as the part below, at the very least, and calculating the rise in the roof at only one in four, there would be plenty of room to allow a height of about 5 feet to the upper storey.

At the floor-level on the *east* side of each of the seven cells, Nos. 5 to 11, is a low bench or shelf, from 9 inches to 18 inches high (fig. 11). This had been formed by placing a line of small slabs, set edgeways, between the outer ends of the upright flags and using them to support a close-set series of flat slabs which stretched back to the lateral wall. These shelves had been disturbed and badly broken when the roof fell. On

¹ This was discovered during the operations carried out by the Office of Works. The individual paving-stones have not been outlined on the plan, to prevent confusing them with the low shelves at the ground level beneath.

every one of them except that in Cell No. 11 were the remains of from two to four human skeletons. In the south end of Cell No. 6 the remains of three skeletons in a very fragmentary condition were placed under the shelf as well. Two skulls were recovered from the inner compartment of Cell No. 12. On the *west* side of the chamber



Fig. 11. Midhowe Chambered Cairn : Inner end, showing low Shelves on east side.

there were no shelves, and only one deposit of human remains was found, this coming from Cell No. 8.

NEOLITHIC BURIALS AND RELICS.

Twenty-five individuals—seventeen adults, six young persons from fourteen to twenty years of age, and two children under four—were represented by the remains found in the primary burials at the bottom level, on the shelves, or on the floor.

Generally speaking, the bodies had been placed with their backs

to the eastern wall, and so faced the central passage. Those at the southern end of the cells lay on their left side and those at the northern on their right. Most of the skeletal remains had been deposited on the top of the low shelves between the divisional slabs. Only four deposits were found under the shelves and three on the floor without any structural arrangements.

Cells Nos. 1 to 4.—No human remains were found at the Neolithic level in any of these divisions.

Cell No. 5.—Four deposits of bones representing four individuals



Fig. 12. Midhowe Chambered Cairn: Skeletal Remains at north end of Cell No. 5.

were found here. At the south end were the remains of the skeleton of a young person, perhaps from fourteen to sixteen years of age, lying on its left side, the skull in the south-east and the knees drawn up. At the back near the centre were the collected remains of the skeleton of an adult male, the limb bones being placed against, and parallel to, the wall, with part of the skull above them. Nearer the front of the shelf, but slightly to the north, was another skeleton, that of a young man from sixteen to twenty years of age, which had been placed in a crouching position on its left side. Heaped up in the north-east corner was the skeleton of an adult male; the pelvis lay in the corner with the broken skull in an upright position above it, the left side towards the wall, and above these were ribs and limb bones surmounted by the lower jaw. The photograph (fig. 12), shows this jaw lifted down and placed in front.

Cell No. 6 contained four deposits, the first three lying on the shelf and the fourth beneath its southern end. In the south-east corner were the remains of the skull of an adult, who had been laid on the left side. The vertebræ lay along the wall and the knees were drawn up in front. About the middle of the cell was a broken skull, part



Fig. 13. Midhowe Chambered Cairn: Southern half with Skeleton in south end of Cell No. 7.

of a lower jaw, and other bones of a second adult. The skeleton of an adult male lay against the north-east corner. The skull was placed upright facing the passage, the knees were well drawn up, and the left humerus stood high up near the skull. From the position of the pelvis and other bones it appeared that this body had been placed in a sitting position. The fourth deposit, that under the shelf, was not bulky, but three individuals—two adults and a child from three to four years of age—were represented by the bones.

Cell No. 7.—In this cell were three deposits. The skeleton of

a young male, sixteen to twenty years of age, lay on its left side in the south end. The skull stood upright in the south-east corner facing the passage, the spine lay along the wall with the elbows at the sides and the hands in front of the breast, while the knees were drawn up (fig. 13). In the north end were the remains of a young individual, from sixteen to eighteen years old, lying on the right side. The skull reposed face downwards about one foot from the wall, the spine was much bent, a femur lay at right angles across the shelf, and the heels were well drawn up. In front at a slightly lower level was the skull of an adult male, face downwards with its back to the wall, with some vertebræ and other bones.

Most of the pottery, as also the flint knife, came from the opposite side of this cell, but a few pieces were found trodden into the floor of the passage.

Cell No. 8.—This cell yielded three deposits. Placed in a reclining position on its left side against a sloping slab in the south-east corner were the remains of the skeleton of a child, probably from two to four years old. The skull stood upright facing the passage, the pelvis lay against the wall, and the knees were drawn up. Near the middle and about one foot from the wall were the fragments of an adult's skull, and a few inches farther north more cranial fragments of a young person. The fairly complete skull of an adult female lay in the north-east corner, the crown towards the passage. All the teeth were dislodged, but the lower jaw, which was placed with the chin towards the south, retained several.

On the opposite side of this compartment, lying on the floor, were the scanty remains of an adult skeleton, one small piece of burnt bone, and some fragments of charcoal. This was the only burial deposit found on the west side of the gallery.

Cell No. 9.—Three groups of bones were recovered from this cell, having apparently been placed under the shelf (fig. 14). A skeleton of an adult male lay on the left side with the skull in the south-east corner. The knees were drawn up and the vertebræ lay along the wall. In front and almost touching this skull was part of another, that of a young man perhaps under twenty years of age. In the north-east was a skull of an adult male placed face downwards in a slanting position on its right side, as well as leg and arm bones.

Cell No. 10.—In this cell were two deposits, one at the south end and the other rather north of the centre. The first, the remains of the skeleton of an adult female (?), lay on the left side in a contracted position. A rib of an ox was found amongst the bones. The second, the remains of an adult, also lay on the left side with the head and back close to the wall.

Cell No. 11.—Although there was a shelf in this division no human remains were found either above or below it.

Cell No. 12.—On the paved floor on the east side of the inner compartment of this cell were two skulls, too fragmentary to determine sex or age, placed crown upwards and within 3 inches of each other.

Although most of the skeletal remains in the different cells must have been considerably displaced and some of them broken when the fall of the roof took place, and although many of them have disappeared through decay, it is quite evident that some of the burials had been made after



Fig. 14. Midhowe Chambered Cairn: Skeletal Remains in Cell No. 9.

the tissues had wasted away. This was particularly noticeable in the case of the second described skeletal deposit in Cell No. 5, where the long bones were built up along the back wall with the skull on the top of them. The deposit of bones under the shelf at the south end of Cell No. 6 contained the remains of no less than three individuals, but as the total quantity of bones of which it was composed was very small, one is tempted to wonder whether only a few bones of the different bodies had been selected for burial in this place. At all events, the flesh must have disappeared, unless dismemberment has to be considered, before their last deposition took place. In several places only the skull was found.

No human remains were found in the first four cells at the Neolithic level. As some of the inner cells had apparently been used partly as

ossuaries, may it not have been that some of the bodies had been deposited in the cells near the entrance and left there till the flesh and soft parts had decayed, after which the bones were collected and deposited in what was meant to be their final resting-place? If this be so, this cairn must have been used as a burial vault during a lengthy period of time.

Only one implement belonging to the period of the burials was recovered. It was a nicely fashioned knife of brown flint mottled with white, measuring $2\frac{1}{4}$ inches in length, $\frac{3}{8}$ inch in breadth at the widest part, and $\frac{3}{16}$ inch in thickness. The base was oblique and the convex edges met in a rounded point. It was carefully flaked along the edges and across the back, the under side being undressed (fig. 15). This was found with the pottery shards on the west side of Cell No. 7.

Fragments of the shell of an egg, possibly of a rock-pigeon or an owl, were found beneath one of the arm bones near the centre of the east side of Cell No. 5. On the floor under the bones found below the shelf in the south end of the east side of Cell No. 7 was a vertebra of a fish, and on the same level in the south corner on the west side of the same cell, where most of the pottery was discovered, were the skull of a bird, a vertebra of a fish (sea-bream), and many mice bones (Orkney vole). More mice bones were got in the immediate neighbourhood scattered through the fallen debris to a height of 12 inches above the floor.

Compared with the large quantity of pottery found in the much smaller chambered cairns at Unstan and Taverso Thiek, in Orkney, the number of fragments recovered from the cairn at Midhowe must be considered disappointing; still, shards, mostly small, from seven urns were forthcoming. Three of these at least were of the Unstan type¹—that is, they had belonged to shallow, flat bowls with a rounded bottom, an upright wall often slightly everted at the lip, and a pronounced carination or keel at the junction of the wall and the base.²

¹ It has become the practice of some archaeologists to designate this variety of ware as Windmill Hill pottery, after the famous and prolific site in Wiltshire so ably excavated by Mr Alexander Keller, but fragments of fifteen similar vessels, some nearly complete, were found at Unstan in 1881, nearly forty years before the discoveries at Windmill Hill; six more examples were recovered from the cairn at Taverso Thiek thirty six years ago, and the type is present in the pottery found, more than twenty-three years ago, at Ellean an Tighe, North Uist, Outer Hebrides. As it has been the custom of archaeologists to name types of prehistoric relics after the places where they were first discovered, it is only right to call this class of pottery after Unstan, the first British site on which it was found.

² *Proc. Soc. Ant. Scot.*, vol. ixiii, pp. 40-44, figs. 4-11 and 13.



Fig. 15. Midhowe Chambered Cairn: Flint Knife. (.)

The pottery consists of:—

1. Rim and wall fragments of a plain dark-coloured vessel, possibly over ten inches in diameter at the mouth, with a slightly everted rim and a rounded moulding, $1\frac{1}{4}$ inch below the lip (fig. 16, No. 1, and fig. 18, No. 1), found amongst the bones in the centre of the east side of Cell No. 8.

2. A large piece and many small fragments of a shallow, round-based urn with a vertical wall, a slightly everted lip rounded on the top, and



Fig. 16. Midhowe Chambered Cairn: Fragments of Clay Urns.

showing a prominent carination at the junction of the wall and the base (fig. 17, and fig. 18, No. 2). The ware is thin, $\frac{5}{16}$ inch at most, and it is of reddish-brown colour. The wall shows three deep grooves under the lip, made by the stab and drag process, and the space below is occupied with vertical straight lines incised by the steady stroke of a pointed instrument. The vessel has been 9 inches in diameter at the mouth, and about 3 inches in height. It was found lying half on its mouth on clay on the west side of Cell No. 7.

3. A few fragments of a shallow carinated urn of thin, light brown, vesicular ware, with a slightly everted upright wall and rounded base (fig. 16, No. 2, and fig. 18, No. 3). The vessel has been about 10 inches in diameter at the mouth, and the wall is only $\frac{3}{16}$ inch thick. On the

latter are two rows of widely spaced dragged finger-nail markings. It was found on the west side of Cell No. 7.

4. A small fragment from the junction of the wall and rounded base of a carinated urn of reddish-brown vesicular ware, decorated above the carination with groups of incised lines slanting alternately from right to left and from left to right. This came from the west side of Cell No. 7 (fig. 16, No. 3, and fig. 18, No. 4).

5. Two small fragments of very dark-coloured pottery, one from the rim and the other from the wall of an urn. The rim portion, which is slightly everted and rounded on the top, shows lines incised from



Fig. 17. Midhowe Chambered Cairn: Part of Clay Urn.

right to left, and the wall portion incised chevrons (fig. 16, Nos. 4 and 5, and fig. 18, No. 5). Probably they belong to the same vessel. They were found on the west side of Cell No. 7.

6 and 7. Two small rim fragments of two vessels of dark-coloured pottery of vesicular texture. Both are ornamented under the lip, which is vertical and rounded on the top, with two narrow bands of short, vertical, incised lines, bordered above and separated from each other by single transverse lines (fig. 16, Nos. 6 and 7, and fig. 18, Nos. 6 and 7). In one a small part of the inside of the base is to be seen, showing that the bottom had been curved; in the other the wall has been rather higher. These were found on the west side of Cell No. 7.

The pottery is all thin and of good texture. Several pieces contain a slight admixture of stones crushed small, a feature hardly observable in those of vesicular texture. At least three of the vessels represented

by the shards are of the Unstan type of Neolithic pottery. The inside of the largest of these fragments (fig. 17) shows a slight glossiness, a feature remarked on many of the urns from the Unstan cairn.

We have seen that the form of some of the vessels from Midhowe is the same as many of those found at Unstan and Taiverso Tuick. A few of the shards from Eilean an Tighe, North Uist, Outer Hebrides, belong to vessels of the same shape. In the ornamentation also there are resemblances. One of the commonest designs at Unstan and Taiverso Tuick was groups of lines slanting alternately to the right

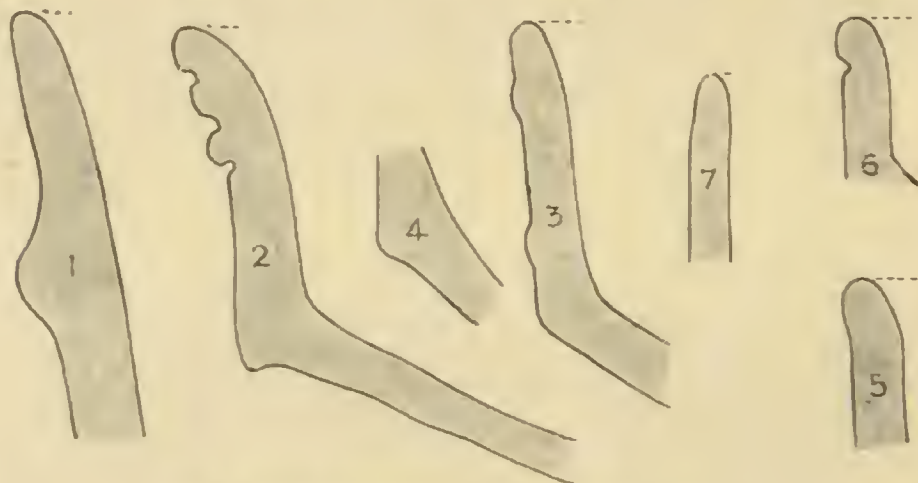


Fig. 18. Midhowe Chambered Cairn: Sections of Pottery. (J.)

and to the left. It occurs on one shard from Midhowe (fig. 16, No. 3), and is also to be seen in the pottery from Eilean an Tighe.¹ The ornamentation of the best-preserved piece from Midhowe consists of transverse lines with vertical lines below. Two pieces from Eilean an Tighe are similarly decorated.² Dragged finger-nail impressions occur on pottery from Midhowe; Unstan; Kenny's Cairn, Caithness;³ and Glenluce Sands, Wigtownshire.⁴ Some of the pottery from the last two localities have also pinched markings.

Most of the pottery was found in the stall on the west side of Cell No. 7, but a few shards came from the passage in front of this stall and of Cell No. 8, which adjoined it. Pieces of one urn were discovered in direct association with human remains on the east side of Cell No. 8.

¹ *Proc. Soc. Ant. Scot.*, vol. lxiii, p. 89, fig. 53, No. 8.

² *Ibid.*, vol. lxiii, p. 89, fig. 53, Nos. 13 and 14.

³ *Ibid.*, vol. lxiii, p. 86, fig. 51, No. 5.

⁴ *Ibid.*, vol. lxiii, p. 86, fig. 51, No. 4.

It is difficult to understand why the great bulk of the pottery should have been placed in one cell and on the side of it opposite to that on which all the bodies except one were found, and why such small fragments should have survived. It is possible that when later burials were taking place the pottery vessels deposited earlier had been broken, some of the pieces being thrown aside and others trampled underfoot.

The only relics found at the floor-level of Cells Nos. 1 to 4 were part of a red-deer antler and a heap of limpet-shells amounting to about three gallons in quantity, which came from the north-east corner of Cell No. 1.

LATER BURIALS AND RELICS.

We have seen that the whole of the chamber was blocked with stones fallen from the roof. Food refuse in the form of bones of ox, sheep, and red-deer, with fragments of three antlers, one broken across a perforation, fish-bones and some limpet-shells, were found all through the debris. In addition, two skeletons were discovered in Cell No. 4, at a height of about 4 feet from the floor of the chamber. These had been buried after the collapse of the monument. The first skeleton, that of an adult male, lay in a crouching position in the south-east corner of the cell, the head to the south facing the east. The other skeleton, that of an adult female?, lay in the north-west corner of the cell, but the body had been placed in a rudely formed cist-like structure, measuring 2 feet 6 inches square, the east side formed by a slab set on edge and the south end by small flags laid on the flat. The other side and end were formed by the western wall of the cell and the divisional slab on the north. Like the first skeleton this one had been buried in a crouching position on the right side, the skull lying to the south facing the east. The skulls were too fragmentary to indicate whether the people were long- or round-headed.

In addition to the food refuse already referred to, there were picked up amongst the fallen material five hammer-stones, a stone pestle, measuring $7\frac{1}{2}$ inches long and $2\frac{1}{2}$ inches in diameter, a rude stone implement of the type found in such abundance in Orkney and Shetland, smoothly pointed at one end and chisel-shaped at the other, measuring $14\frac{1}{2}$ inches in length (fig. 19), a fragment of another similar object, and a part of a club-like implement of stone pitted by use at one end, measuring $11\frac{1}{2}$ inches in length.

A few small shards of hand-made pottery of light brown colour, containing a slight natural mixture of small stones, were found 15 inches under the surface near the north end of the cairn. The ware was of quite good quality with a smooth outer skin, but none of the pieces

was large enough to indicate the shape of any part of the pot or even the thickness of the wall. Part of what looked like the handle of a mediæval jug of red pottery, without any traces of glaze, was recovered half-way up amongst the debris on the west side of Cell No. 6.

Projecting outwards from the north-east and south-east corners of the monument are two well-built walls showing an average breadth of about $4\frac{1}{2}$ feet. The best-preserved one, on the north-east, rises to a height of about 4 feet, where it abuts on the cairn. This wall dies out 68 feet from the cairn, and the other 45 feet. In the north-east projection was an opening 2 feet wide, 36 feet 6 inches from the cairn, and in the south-east projection, about $3\frac{1}{2}$ feet from the main building, was a similar opening, measuring 2 feet wide on the north side and 3 feet on



Fig. 19. Midhowe Chambered Cairn: Rude Club-like Stone Implement.

the south. These projecting walls are suggestive of the horns seen in the horned chambered cairns of Caithness and other parts of the north and west of Scotland; but the foundations of these walls are from 9 inches to 12 inches lower than the base of the cairn, the foundation courses of which run right through them. The character of the building is different from that of the main structure, and the projections do not connect with it in the fine flowing curves of the typical horned chambered cairn. No traces of similar constructions were observed at the north-west or south-west corners. It would thus seem that the projecting walls are secondary, and probably were erected at a much later time than the cairn.

Lying against the north-west corner of the monument was a heap of stones and debris in which was found a cist-like structure.

The Midhowe cairn with its peculiar structural features is the first of its kind to be recorded, and it adds another to the already numerous varieties of the chambered cairn of Scotland, long and round, horned and unhorned. Although we have used the term "cairn" in describing this monument, it is not a cairn, which is a heap of stones, in the strict

sense of the word. It has been an imposing structure, carefully built and doubtlessly rising to a considerably greater height than its present condition would indicate, and the name of *mansoleum* may well be applied to it.

The chambered cairns of Caithness and Orkney generally have the main chamber domically roofed by inward corbelling, but at Midhowe the roof has been formed by lintels, and, to judge by present appearances, the cells have been highest in the centre and have gradually decreased in height towards the ends. Other cairns having chambers of approximately regular width have been excavated at Yarhouse (Yarrows), Caithness,¹ and at Unstan, Orkney.² At the former place there are two cairns and at the latter one, all three being round. The two Yarhouse cairns have three compartments separated from each other in a fashion similar to those in the Midhowe cairn, and one of them has also the inner end finished off with a large slab (fig. 20). The Unstan cairn, famous, as we have seen, for the large amount of pottery it yielded, lies about thirteen and a half miles to the south-south-east of Midhowe, on the neighbouring island of Mainland, and it is the one which most closely resembles our example. It contains a chamber of fairly regular width, measuring 21 feet in length, divided into five cells by projecting lateral slabs, the tallest of which is about 5 feet high (fig. 21). The entrance passage, however, does not run into an end chamber in the line of its main axis, but penetrates from the eastern side of the cairn into the second cell from the south near its centre. Thus the cairn at Unstan has two end cells closed at the back, while that at Midhowe has only one. The backs of these cells are to a certain extent similar in construction. At Unstan they consist of a slab with building above, and at Midhowe of a slab only. There is a further resemblance in the southern cell at Unstan to the northern one at Midhowe; both are subdivided into two compartments by slabs set on edge, but at Unstan they are placed longitudinally and at Midhowe transversely. In the Unstan cairn there is in addition a small cell on the west side of the gallery. Such cells occur in varying numbers in many of the north country chambered cairns, but there is none at Midhowe.

There are three partially denuded cairns on Rousay—one, the Knowe



Fig. 20. Plan of Chambered Cairn at Yarhouse, Caithness.

¹ *Proc. Soc. Ant. Scot.*, vol. vi. p. 444, pl. xxvii, No. 2.

² *Ibid.*, vol. xix. p. 313, fig. 1.

of Rumsay, near the long-horned cairn, the Knowe of Laird, at Hutton; another, the Knowe of Yarso, at Frotoft; and the third, the Knowe of Lingro, at Lingro—which though much shorter seem from surface indications to be of the same class as the Midhowe cairn.

The peculiar method of dividing the chamber of a cairn into compartments by slabs projecting from the sides, which is seen so often in Orkney and Caithness, no doubt has been brought about by the

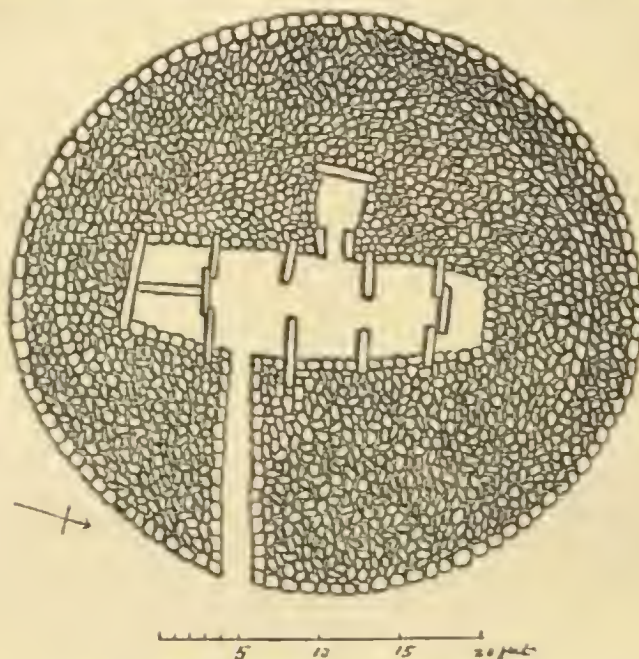
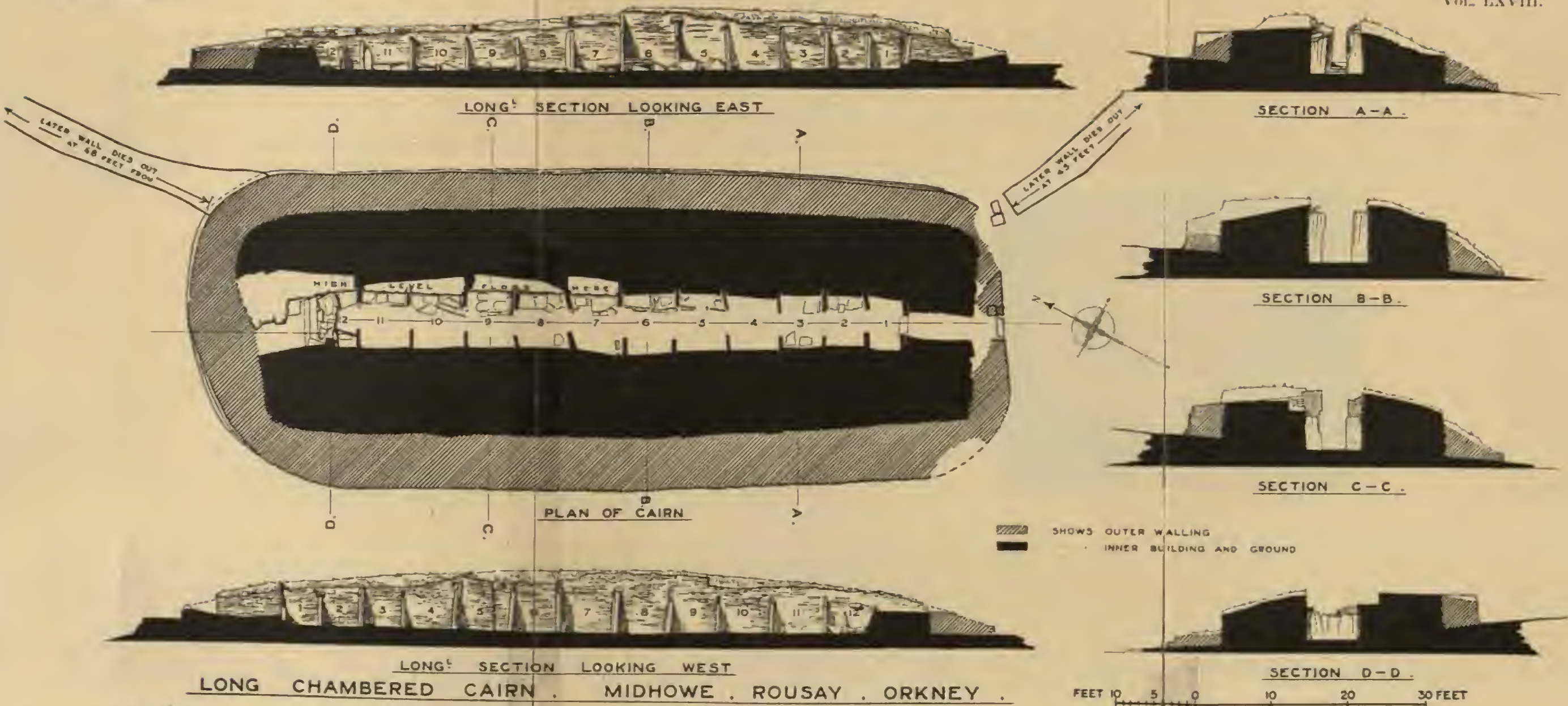


Fig. 21. Plan of Chambered Cairn at Unstan, Orkney.

character of the local building material. The stone of the Old Red Sandstone formation, which extends over such a considerable part of both counties, splits readily into slabs of varying thickness, and where it is exposed to the elements abundant material requiring a minimum of work to make it suitable for building is available. To this day field-boundaries in Caithness are often formed by rows of slabs, set on end, instead of by dry-stone dykes.

We are indebted to H.M. Office of Works for permission to reproduce plans (Pl. V.) and photographs shown in figs. 1 to 7, and we should like to acknowledge our obligation to Mr James K. Yorston, Corresponding Member, and to his son James, who did the actual work of excavation in such a careful and intelligent way.



J. GRAHAM CALLANDER AND WALTER GRANT.

Midhowe Chambered Cairn: Plan and Sections.

PLATE V.

[To face page 342.

DESCRIPTION OF THE HUMAN SKELETAL REMAINS.

By Professor ALEX. LOW, M.A., M.D., F.S.A.Scot.

In this collection, while the bones from each chamber have been carefully sorted out and kept separate, a study of the skeletons is difficult, on account of the fragmentary condition of the bones.

The human remains represent twenty-five skeletons recovered from the Neolithic level, and two skeletons of later date recovered from the high level in 1932. Of the twenty-five skeletons from the Neolithic level,



Fig. 22. Midhowe Chambered Cairn: Profile View of Skull No. 12.

seventeen are those of adults; six of young individuals from fourteen to twenty years of age; and two of children from three to four years of age.

In many instances the articular extremities of the long bones are defective, while the shafts are well preserved, the fractured ends showing a characteristic dead-white appearance. However, from the material available from the Neolithic level it is possible to learn a good deal as to the physical characters of the builders of the chambered cairn.

Skulls.—The skulls are mostly broken into such fragments that it has not been possible to reconstruct them. Three skulls are practically complete except for the mandibles; the face region of one skull and four separate incomplete mandibles admit of some measurements being recorded.

Skull No. 12, from the north end of Cell No. 6, is that of a male beyond

middle life, the sutures being mostly obliterated except those in relation with the temporal bone. It is rather small, with a cubic capacity of 1375 c.c. of mustard seed. The cranial wall is of average thickness. The profile view (fig. 22) shows a long skull with face relatively long and slightly prognathic; the glabella and superciliary ridges slightly marked with no depression at the root of the nose; the forehead receding but bulging in its upper part ("frontal boss"); vault rather low and



Fig. 21. Mldhowe Chambered Cairn: Vertical View of Skull No. 12.

sloping down to the projecting occipital region. The vertical view (fig. 23) shows the relative length as compared with the breadth; the length-breadth index of 73.5 places the skull in the *dolichocephalic* group. The occipital view (fig. 24) is pentagonal in outline with the parietal eminences placed high up and the sides flattened. The face is moderately long (fig. 25), the nose narrow, and the orbits rectangular and of medium height.

Skull No. 3, from the north end of Cell No. 9, is also that of a male, and the condition of the sutures would indicate an individual about forty-five years of age. It has the same general characters as Skull No. 12, but it is slightly longer and the frontal region is somewhat broader.

As shown in Table I., the measurements and proportions of the two skulls are very similar.

Skull No. 6, from the south end of Cell No. 8, has female characters, and, further, along with the skull is a piece of pelvic bone which is that of a female. The vault and face are shorter and broader and the orbits narrower. The length-breadth index is 75.1—*mesaticephalic*.

A feature of the skulls is that the crowns of the teeth are much worn, and while there are no signs of caries the tooth-sockets show evidence of infective processes. Further, several of the separate pieces of jaws show marked irregularity and crowding of the teeth, and in one case impaction of the wisdom teeth: troubles we usually associate with modern civilisation. It is a remarkable coincidence that in each of the three skulls the mandibular articulation on each side shows evidence of

osteo-arthritis, with roughening and lipping of the articular surface; in one instance the smooth articular cartilage must have been completely eroded and the bony surface exposed. Several of the long bones show similar rheumatic changes.

There are a number of separate vertebrae, but there is nothing special to note regarding them except that in several instances they show very marked evidences of osteo-arthritis.

Bones of Extremities.—There is one intact clavicle, a left male bone, short and straight, and only 140 mm. in length.



Fig. 24. Midhowe Chambered Cairn: Occipital View of Skull No. 12.



Fig. 25. Midhowe Chambered Cairn: Face View of Skull No. 12.

There are five fairly complete humeri, all of which are those of males. The total lengths detailed in Table II. yield a mean of 303 mm.; a relatively short measurement. The deltoid eminence of these bones is prominent, especially the posterior portion.

Two complete adult male left femora have a maximum length of 425 mm. and 430 mm. respectively; measurements again below the average length recorded for bones belonging to the Neolithic Age—in fact, little more than the average length given for the Neanderthal type of femur. Both femora show well-marked *platymeria* and torsion of the shaft.

Four male tibiae are short, the total length of the longest measuring 350 mm. There is lateral flattening of the upper third of the shaft—*platynemia*, and while there is no marked degree of retroversion of the head, the articular facet on the lateral condylar surface is convex, and

TABLE 1.

Measurements in mm. of Skulls from a Long Chambered Cairn
near Midhowe, Rousay, Orkney.

	No. 12 from Cell 6 N.	No. 3 from Cell 9 N.	No. 6 from Cell 8 S.	No. 5 from Cell 9 S.
Sex	Male	Male	Female	Male
Cubic capacity	1375 c.c.	1400 c.c.	1350 c.c.	..
Glabello-occipital length	185	190	177	..
Ophryo-occipital length	183	186	175	..
Nasio-inional length	172	180	160	..
Minimum frontal breadth	105	102	95	..
Maximum frontal breadth	112	112	110	..
Parietal breadth	136	138	133	..
Basibregmatic height	127	128	131	..
Biauricular breadth	121	118	116	..
Basinasal length	103	107 ap.	97	..
Basialveolar length	108	106 ap.	93 ap.	..
Nasialveolar height	72	74 ap.	63 ap.	..
Nasimental height . . . . .	...	...	...	116
Bizygomatic breadth	131	...	130	128 ap.
Nasal height	47	51 ap.	45	46
Nasal breadth	23	23 ap.	22	23
Orbital height, R.	33	...	31	32
" " L.	33	...	32	32
Orbital breadth, R.	30	...	39	38
" " L.	39	...	39	39
Alveolar length	57	51	43 ap.	50
Alveolar breadth	58	60 ap.	50 ap.	60
Sagittal arc, 1	127	128	120	...
" " 2	120	130	130	...
" " 3	120	120	112	...
	367	—378	—362	...
Length foramen magnum	32	31	31	...
Transverse arc	306	298	295	...
Circumference	520	528	501	...
<i>Indices.</i>				
Length-breadth	73.5	72.0	75.1	...
Length-height	68.6	67.1	74.0	...
Gnathic	101.9	99.1	95.9	...
Upper facial	55.0	...	48.1	...
Total facial . . . . .	...	...	...	90.6
Nasal	48.9	42.6	48.9	50.0
Orbital, R.	81.6	...	79.5	81.2
" " L.	81.6	...	82.0	82.0
Alveolar	101.7	111.1	116.2	120.0

CHAMBERED CAIRN NEAR MIDHOWE, ROUSAY, ORKNEY. 347

is continued backwards and downwards on to the posterior aspect; in addition, three of the specimens show a facet on the anterior margin of the lower articular surface; these features indicate adaptation to the "squatting" posture.

There is one male fibula intact, a short, stout bone showing fluting of the shaft, and with the transverse diameter greater than the antero-posterior.

In Table II. stature is set forth as calculated from the long bones, and though there may be a margin of possible error the stature is definitely short. The tallest man was 5 feet 3½ inches and the shortest just 5 feet 2 inches.

TABLE II.

Measurements in mm. of Bones of Extremities from a Long Chambered Cairn near Midhowe, Rousay, Orkney.

	No. 5 from Cell 9 S.		No. 11 from Cell 7 S.		No. 12 from Cell 6 N.		No. 15 from Cell 5 N.		No. 17 from Cell 5, middle.	
Sex	Male		Male		Male		Male		Male	
	R.	L.	R.	L.	R.	L.	R.	L.	R.	L.
Humerus	295	...	310	...	305	295	303	...	...	...
Ulna . . . . .	...	...	...	...	...	...	...	252	...	...
Femur:										
Maximum length . . .	...	...	...	425	...	...	...	...	...	430
Oblique length . . .	...	...	...	418	...	...	...	...	...	...
Upper third of shaft:										
Ant. post. diam. . .	...	...	...	23	...	24	...	...	...	25
Trans. diam. . . .	...	...	...	32	...	33	...	...	...	34
Platymetric index . .	...	...	...	71.8	...	72.7	...	...	...	73.5
Tibia:										
Maximum length . . .	...	341	...	...	...	344	...	330	...	350
Ant. post. diam. . . .	...	39	...	...	...	38	...	40	...	45
Trans. diam. . . . .	...	26	...	...	...	23	...	23	...	28
Platymetric index . .	...	69.6	...	...	...	69.5	...	57.5	...	62.2
Fibula . . . . .	...	...	...	...	...	...	...	327	...	...
Stature—calculated . .	5	2½"	5	3½"	5	3½"	5	2"	5	3½"

Specimens of Scottish Neolithic skulls are few in number, but comparing these skulls with the skulls described by Professor Bryce,¹ from the Chambered Cairns of Arran, we find that they agree in essential respects. While the skulls on the whole are smaller, their general configuration is very similar. Thus the crania are long, with the vertex

¹ *Proceedings*, vol. xxxvi. p. 74.

low and occiput projecting; face somewhat long, with nose narrow and orbits not wide.

It seems clear that we have here representatives of the same dolichocephalic race of short stature that in Neolithic times inhabited Britain.

The two skeletons X and Y recovered from the high level in 1932 are unfortunately fragmentary. Skeleton X, as judged by the pieces of long bones, is probably that of a male.

The bones of Y are more delicate and probably are those of a female. There is a fairly complete right femur with a maximum length of 415 mm. The upper third of the shaft shows flattening—*platymeric* index 70.5. The lower three-fourths of the right tibia is intact, and also shows flattening, and on the anterior margin of the lower articular surface there is a "squatting" facet. Calculated from length of femur the stature is low—5 feet $\frac{1}{2}$ inch.

For the opportunity of examining these Neolithic skeletal remains I am grateful to Walter G. Grant, Esq., F.S.A.Scot., of Trumland, Rousay, who has presented them to the Anatomy Museum, University of Aberdeen.

REPORT ON THE ANIMAL BONES. By MARGERY I. PLATT, M.Sc.,
Royal Scottish Museum.

A number of animal bones occurred in the excavation of this Neolithic chambered cairn found near Midhowe, Rousay, Orkney. Those sent here were found during two successive years of work, and a list of the representative animals is cited below chronologically.

Among Fallen Debris at Higher Levels.

Ox.—The remains of this animal are more abundant than of any other. According to two fragments of horn-cores they appear to be of a shorthorn variety. The teeth are very wide and strong, and there are numerous milk molars. These bovine remains are almost without exception of immature animals.

Sheep.—This is sparsely represented, and there are no horn-cores to give indication of the breed. The measurements of one long slender cannon-bone are given below:

Metatarsal:

Max. length	13.6 cms.
Max. width of proximal end	1.85 ..
Max. width of distal end	2.2 ..
Min. width of shaft	1.05 ..

It would be unwise to draw conclusions from such scanty evidence, but suffice it to say that this metatarsal, though slightly smaller, agrees in proportions with the corresponding bone of the Soay sheep.

Pig.—Numerically the remains of the pig are even less important than the sheep. All the bones are of very young animals.

Red-deer.—Two fragments of an antler represent this animal.

Birds.—The remains of these are both varied and more numerous than either sheep or pig. One or more bones of Buzzard, Falcon, Young Eagle, Cormorant, Shag, and Gannet are present in this section.

Bottom or Neolithic Level.

Cell No. 1.—At this level immature ox and sheep bones similar to those noted above were found, also the skull of an Orkney Vole. The birds represented were Skua, Cormorant, Guillemot, Buzzard, and Eagle. Several large thick shells of the limpet are included, and these are of varying shape. Some have very low cones, and indicate their being taken further down the tidal zone than the shells which occur above the limit of neap tides.

Cell No. 12, at level of two human skulls.—Here were found immature bones of the ox and a few bird bones, including Gannet and Cormorant.

Cell No. 12, nine inches from bottom.—Here were found the pharyngeal teeth of the Wrasse (*Labrus maculatus*).

Cell No. 10, skeleton No. 1.—Bones of the ox and sheep were found here.

Cell No. 7, west side.¹—Numerous bones of the Orkney Vole, including lower jaws and fragmentary skulls, were present here. Examination of the teeth show a correspondence with those of *Microtus o. orcadensis* figured by Mr M. A. C. Hinton.² There is no complete skull for comparison of the subspecies; but the length of nasala, alveolar measurements, and the length of the mandible are within the limits of the subspecies *M. o. rousaiensis*. A skull of the Carrion Crow (*Corvus corone*) also occurred here.

Cell No. 7, east side.—A fish-bone was present here, kindly identified by Miss E. Trewavas, B.Sc., of the British Museum, as the vertebra of a Sea Bream (*Pagellus centrodontus*).

Cell No. 6, under a skeleton.—Another vertebra of the Sea Bream occurred here.

Cell No. 5, under a skeleton.³—Several fragments of birds' eggshell were found under an arm bone. No identification has been definitely

¹ These were the only non-human bones found on the west side of the gallery at the Neolithic level. All other animal bones were found on the east side in close proximity to Neolithic human remains.

² *History of British Mammals*, part xvi.

made. Our thanks are due, however, to Mr P. R. Lowe, M.B., B.A., of the British Museum, who kindly examined the shell fragments. He ventures the opinion that they are probably Rock Pigeons' eggs or may be Owls'.

MONDAY, 9th April 1934.

SIR GEORGE MACDONALD, K.C.B., LL.D., D.LITT.,
F.B.A., President, in the Chair.

A Ballot having been taken, the following were elected Fellows:—

JAMES DUSCAN, Conservator Anthropological Museum, Marischal College, Aberdeen, 13 Northfield Place, Aberdeen.

H. H. RODERICK, 12 Battlefield Avenue, Glasgow, S. 2.

JAMES ARTHUR WAITES, A.M.E.E.S., F.R.Asianic S., 14 Owen Street, Accrington, Lancs.

The following Donations to the Museum were announced and thanks voted to the Donors:—

(1) By SAMUEL SMITH, Corresponding Member, the Finder.

Rim fragment of a Pitcher of cream-coloured ware with slightly projecting rim, twelfth or thirteenth century, and fragment of Iron Slag, found at the mote at Bonnybridge, Stirlingshire.

(2) By R. S. YOUNG, J.P., F.S.A.Scot.

Box of eleven (originally twelve) Hydrostatic Balls, glass "Beads for proving spirits," made by P. Massino, 1 North College Street, Edinburgh.

(3) By A. D. LACAILLE, F.S.A.Scot.

Early Acheul Flint Hand-axe (*coup-de-poing*), measuring $4\frac{1}{8}$ inches in length, found by the donor at Furze Platt, Maidenhead, Berks.

(4) By JOHN BROWN, Flaws.

Weaving Comb of Deer-horn, with seven teeth, one broken, measuring

4 inches in length, found with kitchen-midden refuse while ploughing near an earth-house at Flaws, South Ronaldshay, Orkney.

(5) By HENRY TOD, jun., Ph.D., 35 Oxfangs Road, Edinburgh.

Food-vessel Uru encircled by two cordons, with the upper part of the wall nearly vertical and the lip bevelled downwards towards the inside (fig. 1). The ware is reddish on the outside, but the core is black, and consists very largely of crushed stone. The urn measures 4 inches



Fig. 1. Food-vessel found in Edinburgh.

in height, $5\frac{1}{2}$ inches in diameter at mouth, $5\frac{1}{8}$ inches at the cordons, and 3 inches at base. The top of the rim, which is $\frac{1}{2}$ inch broad, has three concentric lines of impressions made by a whipped cord. The entire wall is decorated with five transverse zigzag lines in false relief, bordered above and below by three lines of whipped-cord impressions, and separated by two, three, two, and four similar markings. The lower part is covered with vertical lines formed in the same fashion, and these are continued across the base. About two-thirds of the vessel survived, and it has now been restored.

Button of Shale of domical shape, slightly imperfect, measuring $\frac{3}{4}$ inch in diameter and $\frac{1}{4}$ inch in thickness, with a V-shaped perforation on the under side, placed slightly to one side. The perforation has been carried right through the object and shows one hole above.

Both were found in February 1934 in a short cist, wanting the cover, lying north-north-east and south-south-west, and measuring about 2 feet 4 inches in length, 20 inches in breadth, and 1 foot in depth, in the garden at 35 Oxbgangs Road, Edinburgh, by the donor. The urn lay in the south corner of the cist.

The Cairn Stone, a fine monolith, bearing cup-marks, stands about 180 yards to the north-west.

The following Purchases for the Museum were intimated:—

Rudely made Stone Axe with circular hollows on opposite faces, measuring $6\frac{1}{2}$ inches by $2\frac{1}{8}$ inches by $1\frac{1}{2}$ inch, found at Fedeland (Fethaland), North Main, Shetland.

Flat Bronze Axe, measuring $5\frac{1}{2}$ inches in length, $2\frac{3}{4}$ inches across the cutting edge, much pitted, found to the west of the site marked "Mote" on the map, at Brocklock, Carsphairn, Stewartry of Kirkcubright.

The following Donations to the Library were intimated and thanks voted to the Donors:—

(1) By Dr ADOLF MAHR, Keeper of Irish Antiquities, National Museum, Dublin, the Author.

The Blackrock Brooch. (*County Louth Archaeological Journal*, 7. 1933.)

(2) By ALEXANDER O. CURLE, C.V.O., F.S.A., F.S.A.Scot.

Roman Britain. (Reprinted from *The Year's Work in Classical Studies*.) Edited for the Journal's Board of the Classical Association. By W. H. S. Jones, M.A., 1918-19.

City and County of Bristol. By W. R. Barker. Bristol, 1901.

Instituttet for Sammenlignende Kulturforskning, Serie C II-3. Nye Boplassfund fra Yngre Stenalder i Finnmark. By Anathon Bjørn. Oslo, 1930.

Föremål i Ståtens Historiska Museum från Antikvitetsarkivets Tid. By Andreas Oldeberg. n.p., n.d.

Ståtens Historiska Museums Utställning, 1930. Omfattande Föremål från Antikvitetskollegiets och Antikvitetsarkivets Tid. By Andreas Oldeberg.

Särtryck ur Finskt Museum, 1920. Huvnelevfyndet. By C. A. Nordman.

Town Planning in the Roman World. By Professor F. Haverfield, LL.D., D.Litt., F.S.A. (*Transactions of the Town Planning Conference*, Oct. 1910.)

Nagra Träskulpturer från Aeldre Medeltid i Egentliga Finland. By C. A. Nordman. Helsingfors, 1932.

Illustrierter Führer durch das Provinzial-Museum in Trier. By Professor Dr Felix Hettner. Trier, 1903.

Ancient Rome and Ireland. By F. Haverfield. (Reprinted from *The English Historical Review*. January 1913.)

Lincoln City and County Museum Publications. Nos. 7, 14, 16.—Roman Antiquities in the City and County Museum, Lincoln. Parts iii., iv., v. By Arthur Smith, F.L.S., F.E.S., 1909–1913.

The Castle of Newcastle. A Short Descriptive Guide to the Keep, Black Gate, and Heron Pit. Newcastle-upon-Tyne, 1908.

"The Beaton Panels." (9 Photos.)

The London Museum, Saint James's, S.W. 1. Catalogue of an Exhibition of recent Archaeological Discoveries (Prehistoric and Saxon Epochs) in Great Britain. August, 1932.

The Prehistoric Trephined Skulls of Great Britain, together with a Detailed Description of the Operation probably performed in each Case. By T. Wilson Parry, M.A., M.D.

Saertrykk av Universitetets Oldsaksamlings, Årbok, 1929. Boplussfund fra yngre Stenalder i Aust-Agder. By Anders Nummedal and Anathon Bjørn.

The National Historical Museum. A Brief Guide to the Collections. Stockholm, 1930.

Kökkenmöddingkulturens Ursprung Föredrag vid Utdelningen av det Hallbergska Priset den 16 Maj 1926. By C. A. Nordman. Helsingfors, 1927.

County Borough of Reading. Public Museum and Art Gallery. Short Guide to the Silchester Collection. By the late George E. Fox, F.S.A. Revised by Mill Stephenson, B.A., F.S.A. Reading, 1912.

Tnam Ruths and Souterrains. By T. B. Costello, M.D. Galway, n.d. Journal of the Galway Archaeological and Historical Society. Vol. ix., Nos. 2, 3, 1916; vol. x., Nos. 1, 2; vol. xi., Nos. 1, 2, 3, 4.

Queen Matilda's Tapestry. (Bayeux.) The Conquest of England.

(3) By Professor V. GORDON CHILDE, B.Litt., F.S.A.Scot, the Author.

New Light on the Most Ancient East: The Oriental Prelude to European Prehistory. London, 1934.

(4) By HIS MAJESTY'S GOVERNMENT.

Calendar of the Fine Rolls. Henry V. A.D. 1413–1422. London, 1934.

(5) By FRANK MILLER, F.S.A.Scot.

Unpublished Letters of Joanna Baillie to a Dumfriesshire Laird. Edited by Mrs W. H. O'Reilly. (Reprinted from *The Transactions of*

the Dumfriesshire and Galloway Natural History and Antiquarian Society, vol. xviii.)

(6) By Sir GEORGE MACDONALD, K.C.B., D.Litt., etc., President.

Proceedings of the Devon Archaeological Exploration Society. 1932. Vol. i. part iv.

(7) By J. GRAHAM CALLANDER, LL.D., F.S.A.Scot.

The Road of the Roman. By John Gibson, F.S.A., York.

(8) By JOHN FRASER, Corresponding Member.

Sketches of East Lothian. By D. Croll. Third Edition. Haddington, 1885.

(9) By E. S. REID TAIT, F.S.A.Scot.

The Rentall of the Bishoprick of Orkney.

The Rentall of the Earldom of Orkney, 1740. Both from The Gilbert Goudie Collection.

(10) By THE TRUSTEES OF THE LATE SIR WILLIAM FRASER, K.C.B.

Manuscript of a Discourse delivered by The Earl of Buchan at a Meeting of the Society of Antiquaries, January 8, 1781.

The following Purchases for the Library were intimated:—

Corpus Inscriptionum Latinarum. Vol. xiv., Fasc. 2. Supplementum. Berlin, 1933.

Acta Archaeologica. Vol. iv., Fasc. 2-3. Copenhagen, 1933.

The Rise of the Celts. By the late Henri Hubert. London, 1934.

The Archaeology of Yorkshire. By Frank and Harriet Wragg Elgee. London, 1933.

The Woodlands and Marshlands of England. By H. A. Wilcox, M.A. London, 1933.

Ur Excavations. Vol. ii.—The Royal Cemetery. By C. L. Woolley, M.A., D.Litt. London, 1934.

The following Communications were read:—

I.

CARVED OAK FROM ST NICHOLAS CHURCH, ABERDEEN.
BY WILLIAM KELLY, LL.D.

Some years ago certain pieces of late-medieval carved oak were acquired by the National Museum of Antiquities. They comprise: (1) Four



Fig. 1. Oak Canopy-front from St Nicholas, Aberdeen.

bays and part of other two bays of a canopy-front such as usually surmounts choir-stalls (fig. 1); (2) five stiles, in the form of spired pinnacles with gablets and crockets, varying in length from about 4 feet 3 inches to 4 feet 4 inches long (fig. 2); (3) a length of foliated and cusped cresting, about 4 feet 4 inches long (fig. 3); and (4) two lengths, about 8 feet in all, of a 6½-inch band, or rail, bearing an inscription in raised Gothic lettering as follows:—



Fig. 2. Oak Stiles from St Nicholas, Aberdeen.

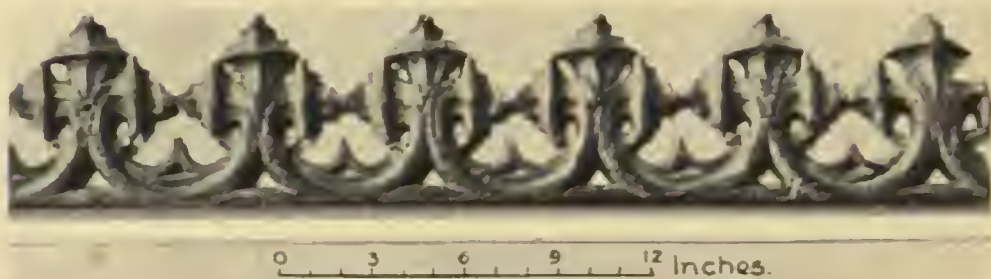


Fig. 3. Oak Cresting from St Nicholas, Aberdeen.

✻ Ad ꝑ laudem ꝑ diui • Nicholai ꝑ ✻
hoc celamen • factū fuit • tempore • p (fig. 4).

That St Nicholas' Church, Aberdeen, was the source from which this carved work came will be made apparent by reference to the published writings of James Logan, John Ramsay, and James Cooper.

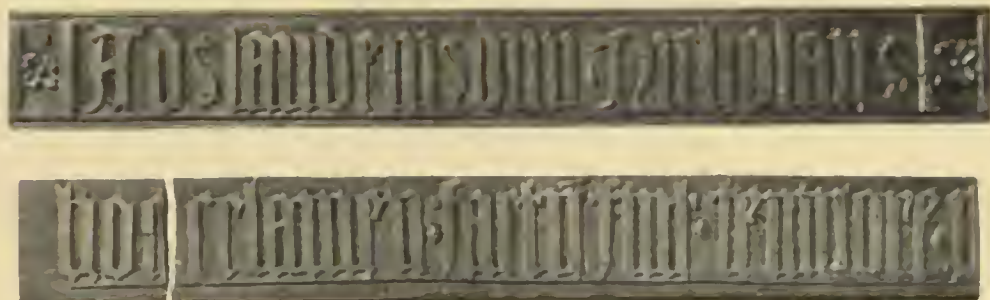


Fig. 4. Inscription in Oak from St Nicholas, Aberdeen.

In his youth, James Logan (1704-1872), author of *The Scottish Gael*, wrote *An accurate and minute description of the East Kirk*, 1818, which was published by the New Spalding Club, in 1892, as an appendix to the *Chartulary of the Church of Saint Nicholas of Aberdeen*, edited by the Rev. Professor James Cooper, D.D. As the East Kirk—the late-mediaeval choir of the Church of St Nicholas—was pulled down in 1835 to make way for the present East Church, Logan's careful description is now of great interest. He says: "The roof of the body of the church is ceiled with timber and adorned with raised work, amongst which are the arms of Aberdeen, and another: a bend charged with three buckles, and the letters P. L. Round the edges is a border of flowers painted blue. On the north side is an inscription in black letter, as follows:—

I (ⁿ shield) M
here

Ad • laudem • diui • Nicholai in • anno •
prepositure • honorabilis • viri Iohis • Mar • hoc •
celamen • factū • fuit • tempore • Patricii •
Leslie • magri • fabrice • huius • ecclie •
anno • dñi • millō • CCCCC • XV.

Above may be discerned the date 1510."

It is thus clear that the lettered boards in the Museum formed part of an inscription that ran along above the high eaves on the north side of the choir of St Nicholas.

Shortly after the demolition of the old choir, John Ramsay, M.A. (1799-1870), an Aberdeen journalist, wrote a series of newspaper articles on the church of St Nicholas. Having given the black-letter inscription practically as above, Ramsay goes on to say: "The above inscription ran continuously in one line along the margin of the ceiling, on the north inner wall above the windows of the clerestory, immediately above the spring of the arch of the ceiling. . . . This inscription was removed to the west end of the modern church."¹ The removal of the inscription from one part of the church to another must have taken place after Logan's notes were made. Ramsay could not have meant, by "the modern church," the church rebuilt in 1837, for all its woodwork was destroyed by fire in 1874. If the pieces of oak under discussion had been in the modern church of 1837, they would have perished in 1874. It can hardly be doubted that they were taken away at the demolition of the old church in 1835.

"When that venerable structure," says Ramsay,² "was doomed to wanton destruction . . . it was resolved that every fragment of carved work should be strictly preserved. Nevertheless, a good deal of it was *sold* and converted into articles of household furniture. The only remnant of the canopy of the choir (a counterpart of that in King's College Chapel, and probably the work of the same artificer, John Findon) was cut up, partly to adorn a set of bookshelves, partly to form a sideboard. . . ."

Dr James Cooper (1846-1922), in his Preface to the *Chartulary*³ of *St Nicholas*, says: "A solitary fragment of the perforated canopies" (of the stalls) "belonged to the late eminent antiquary, Dr John Stuart, and is now in possession of his son-in-law, the Rev. Dr Woodward, Montrose, who assures me that it is at least as fine as anything at King's College."

That the "remnant of the canopy of the choir," referred to by Ramsay, is the "solitary fragment of the perforated canopies" that belonged in 1892 to Dr Woodward cannot be affirmed with certainty; but that the carved work now in the Museum had been in Dr Woodward's possession can hardly be doubted. It is known that the oak-work in question was bought at Montrose by a Glasgow dealer.

Ramsay attributed the stall-canopies of St Nicholas to "John Findon." John Findour, for that was his name, first appears in the Council Register of the Burgh of Aberdeen⁴ under date of 10th April 1495. "The snide day, certane personis vnder writin, of thar ayne fre will has lent

¹ *The Selected Writings of John Ramsay*, 1871, pp. 227-8.

² *Ibid.*, p. 231.

³ *Chartulary of St Nicholas, Aberdeen*, vol. II., 1892, New Spalding Club, p. xxxi.

⁴ *Extracts from the Burgh Records of Aberdeen*, The Spalding Club, 1844, p. 50.

and deliuerit this money efter folling, to pay Ionhe Fendour for the making of the ruff and tymmir of the queyr."

Apparently the new choir of St Nicholas, begun about 1477, was roofed by about 1495; but it was not until 1510-15, as we learn from Logan's notes and from the oak inscription in the Museum, that the decorative work of the ceiling was finished. In the interim we find John Fendour contracting with the Burgh to make the stall-work of the choir.¹

"26th December 1507.

"The same day, it was appouitit betiux the prouest, bailzeis, and consale on that ane part, and Johnne Fendour, wricht, one that vthir part, in maner, forme, and effect efter following: that is to say, the said Johnne sale, God willing, big, oupmak, and finally end and complet the xxxiiij stallis in thar queir, with the spiris and the chanslar dur, and ale vthir thingis according tharto, one his awin expensis, also substanciouly and honorable as he may, as thair ar beguanyne, and bettir gif he cane, betiux this and the fest of Sanct Petyr, callit Lammes, immediat heirefter following, or at the fest of Sanct Michuell nixt, and immediat thurefter following at the ferrast; quilk being completit, and finally endit at the said day, as said is, the prouest, bailzeis, and consale sale content and pay to the saide Johnne tua hundretht pundis vsuale money of Scotland, with ane bontay according to thair honor; and gif he completis nocht the said wark be the said day, thane they sall content and pay to him the same content in the first contrak, and this condicion making nay dirogacioun to the first contrak. To the keping of the quhilkis the said Johnne oblist him be the fuith of his bodie to Gilbert Menzies, prouest, in the twonis nam; and ale sumes of money that he ressanis sal be allouit in the said some, etc."

It is evident that the making of the stalls had been begun before 26th December 1507; if they were finished by Michaelmas 1508 John Fendour must have had a busy workshop and a competent staff. Assuming that the value of Scots money then was to stg. as 1:4, the contract price would have been £50 stg., which, taken at twenty-five times its present purchasing value, would be £1250. Be this as it may, I think it is clear that these canopy-fronts in the Museum are John Fendour's work, as is also the ceiling inscription.

The live stiles (fig. 2) probably formed part of the screen and "chanslar dur" made by John Fendour; but they have been altered and adapted to adorn, perhaps, the set of bookshelves that Ramsay pilloried. The corresponding door of the screen at King's College Chapel is in two leaves, the upper part of each half being open-work, divided by stiles, of which each leaf has two whole and two half stiles, the carved parts of which are very much like those in the Museum.

The only other record² referring to John Fendour is a contract, dated 18th April 1511, and registered in the Sheriff Court books, between

¹ *Extracts from the Burgh Records of Aberdeen*, The Spalding Club, 1844, pp. 77-8.

² *Sheriff Court Records, Aberdeen*, vol. I., New Spalding Club, p. 102.

Andrew Elphinstone of the Selmys, on behalf of Bishop Elphinstone, and "Johne Findour wrycht," for making "the tymmer werk of the grat stepile of the Cathederall Kirk of Aberdoun." This work—the lead-covered spire over the Crossing—was uncovered about 1560, and "not many years afterwards was overthroune by the violence of a great storme of wind."¹



Fig. 5. Interior of Old East Church of St Nicholas, Aberdeen.

The latest example of mediæval wright-work in Aberdeen is the heraldic ceiling of St Machar's Cathedral, put up about 1520. Referring to it, William Orem, Town Clerk of Old Aberdeen, writing early in the eighteenth century, says: "James Winter an Angus man was architect of the timber work and ceiling of said Church." Although Winter is a surname not unknown in Angus, it is possible that we should read Fendour for Winter. The name, which appears in the records as Findour, Fyndour, Fendour, may be of French origin (?Fendeur), and

¹ Gordon's *Description of bothe towns of Aberdene*, The Spalding Club, 1842, p. 22.

might have been easily changed into Winter; *James* Winter may have been a son of John Fendour.

We have seen that Ramsay was disposed to credit John Fendour with the stalls of King's College Chapel; and he remarked that the two ceilings (of the College Chapel and of St Nicholas choir) "exactly resembled" each other, or were "exactly the same."

The building of the oak roof of the College Chapel was probably well advanced when, on 21st October 1506, a contract was entered into for the lead covering. The chapel roof therefore was later than the roof of St Nicholas choir by about ten years: but it is likely that the oak ceilings of both may be contemporaneous. A poor little engraving (c. 1830) of the interior of the old East Church is all we have, showing what the ceiling was like (fig. 5); of the same type as that of King's College Chapel, it had fewer ribs and was not so richly decorated. The engraving shows both a cresting and a valance at the eaves of the apse; possibly the length of foliated cresting (or valance, if it was pendent) in the Museum came from there. Three different patterns of foliated and traceried valance occur at the eaves of King's College Chapel (figs. 6, 7, 8); they are from 9 inches to 10 inches in depth, whereas the St Nicholas example is but 6 inches (fig. 3). But the size and the design of the vine leaves in every one of the four cases under consideration are the same. A seventeenth-century cast-lead eaves-valance, outside the north transept of St Nicholas, is finished at the bottom with a fringe, cast from a piece of mediæval cresting of the same pattern as that in the Museum. Although there is now no cresting at the eaves of the College Chapel (there is only the valance), Billings's interior view shows that eighty years ago there were both. While it seems probable that Fendour wrought the ceilings of both churches, it is almost certain that he had little or nothing to do with the thirty stalls and twenty-two sub-sellia of King's College Chapel.

The general design of the thirty bays of canopy-front at King's is different from that of the St Nicholas canopy. The dividing stiles at King's have applied "buttresses," rising up into gablets and crocketed pinnacles; those of St Nicholas have pedestals designed to carry statuettes, with gabled and crocketed canopies over the niches. All the thirty traceried panels at King's are different, showing extraordinary fertility in design, whereas those from St Nicholas follow one pattern, which is much less elaborate and shows less invention than the similar work at King's. Mature consideration of the masterly design and execution of the Old Aberdeen stalls leads one to conclude that they were made in Flanders; but Fendour may have fitted them up, and he may have added some parts that do not reach the high standard of the



Fig. 6. Oak Valance in King's College Chapel, Old Aberdeen.

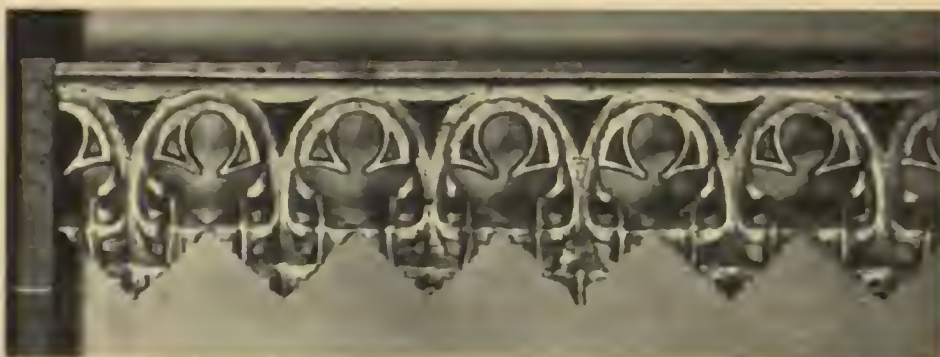


Fig. 7. Oak Valance in King's College Chapel, Old Aberdeen.



Fig. 8. Oak Valance in King's College Chapel, Old Aberdeen.

canopies. The remains, however, of the ancient rood-loft at King's, with its canopies, and the screen, with its two-leaved door, may safely be attributed to Fendoun.

Certain details of this part of the woodwork at King's are similar to those of a long oak desk now in St Mary's Chapel, the fifteenth-century crypt under the east end of St Nicholas; and that desk, without doubt, was part of Fendoun's stall-work. Although the bottom rails of the front and ends appear to be later than the framing, and some other small alterations have been made, yet the desk, on the whole, seems to be much in its original form. It has seven carved panels in front, and one at each end, all to the same design; the top is $2\frac{1}{2}$ inches thick and is slightly sloped; and a hollowed moulding, carved with a series of four-leaved flowers, serves as a bedmould.

These nine carved panels are exactly the same, both in size and design, as those nearest the floor, right and left of the screen-door at King's; and the same four-leaved flowers are also found there, in profusion.

The desk and the screen must have come from the same hands. And the desk must, I think, be the only remnant of those belonging to the choir-stalls. If so, there were no sub-sellia in St Nicholas. A good reason for this, it may be, was that the choir was only 22 feet wide between the pillars; and allowing $5\frac{1}{2}$ feet on each side for the stalls and desks, there would have remained only a width of 11 feet between the opposite desk-fronts. At King's College Chapel, which is about 29 feet wide, the distance between the opposite desks is $17\frac{1}{2}$ feet and about 15 feet between the opposite sub-sellia.

In St Mary's Chapel there are other two ancient carved panels, exactly the same as those of the great desk, and now forming part of a small modern desk.

The Art Gallery, Aberdeen, owns a curious piece of carved oak from St Nicholas. The photograph (fig. 9) is more explanatory of its form than much description would be. It is possible to fix the original position and function of this fragment by an examination of the plan of the choir, together with the engraving (fig. 5) of the interior of the old East Church. The crown of the wooden vault of the apse is shown at a considerably lower level than the apex of the pointed arch between the choir and the apse. A kind of suspended "box," decorated with a valance towards the choir, closed the open gusset; this "box" came to a salient corner at its east end, following the lines of the diagonal ribs: our fragment, attached to the "box," was the boss, 3 inches thick, which gathered up the five ribs and two diagonals of the apse-vault. It will be noted that the carving of the foliage follows exactly the forms used in the crestings, but adapted to the space to be filled; the flower, cut

swiftly and simply, is fresh, although (or because) the carver had done such a flower hundreds of times before. Evidently, the decorative detail turned out by John Fendour and his men was standardised, and repeated over and over again, with a good deal of freedom on occasion, and in very varied settings. The "patterns" changed very slowly; they matured, and grew simpler and stronger, at least for a time: and the



Fig. 9. Oak Boss from St Nicholas, Aberdeen.

handling was so sure and vigorous that the work could hardly fail to be effective and pleasing.

An example of heraldic carving by Fendour, shown on fig. 10, is placed in front of the eaves-valance at the east end of King's College Chapel.

Fendour's style was derived from Flemish or, it may be, French work. John Fendour himself came to Aberdeen early in the last decade of the fifteenth century and found much to do there for many years. I incline to believe that he was either of Flemish or of French extraction; if the family came "from Angus," his father may have worked at Arbroath Abbey. One is led to such speculations by the case of the Franche family of master-masons: John, working at Linlithgow until his death there

in 1489; Thomas, his son, at work in Aberdeen for at least ten years, until about 1530; and Thomas, the son of Thomas, dying at Aberdeen in 1530, others of the family remaining in Aberdeen, while Thomas the



Fig. 10. Royal Arms of Scotland in Oak.

elder, as King's muster-mason, returned to Linlithgow in 1535, and later went to Falkland.

In conclusion, I return to where we began—to the inscription (fig. 4). In passing, note that the little *fleurons* are exactly like those Fendoun always used. A small point that has hitherto escaped printed comment is the peculiar genitive, "Nicholaij." The two final i's are plainly to be seen, and the second has a tail, the two suggesting the letter Y. Did the carver make a mistake, or was the nominative supposed to be Nicholains? Or does the mistake, if it is a mistake, point to any foreign usage?

A CORRECTION.

With reference to my short paper, "Four Scottish Ecclesiastical Carved Oak Panels, c. 1500-25," communicated to the Society in Session 1929-30, I wish to correct some errors. Shortly after the publication of the paper Mr Thomas Innes of Learney, Carrick Pursnivant, pointed out that, on account of the omission of the tressure along the top of the Royal Arms, the carving should be dated somewhere in the 1470's—after 1471. Sometime afterwards, in course of reading *The Bishops of Scotland*, by Bishop Dowden, I learned that the arms of Thomas Spens, Bishop of Aberdeen from 1459 to 1480, were: 1st and 4th [? two covered cups], 2nd and 3rd, three martlets. These arms, surmounted by a mitre, which occur on one of the four carved panels, I had wrongly attributed to Abbot Robert Shaw of Paisley, afterwards Bishop of Moray. Bishop Thomas Spens died 15th April 1480, and was buried next day in Holy Trinity Church, Edinburgh.

Boere, in his *Lives of the Bishops of Aberdeen*, says that Spens "removed the ancient seats (stalls as they are called) in the choir. . . . He put in their places new ones of rare art and beauty, along with a throne of equal artistic beauty for the use of the bishop."¹

It is clear that the four panels belonged to Aberdeen Cathedral and that they were made at some date between 1471 and 1480 for Bishop Spens.

¹ Dr James Molr's translation.

II.

A SEVENTEENTH-CENTURY PEW-BACK FROM THE CHURCH OF
DIPPLE, MORAY. BY JOHN GEDDIE.

There has lately been bequeathed, by will, to the Parish Church of Speymouth, in Moray, by the deceased Miss Isabella Shand, niece of the late Alexander Shand, in the neighbouring village of Mosstodloch, what



Fig. 1. Old Pew-back from Dipple Church.

appears to have been the back of a pew, carved in black oak and bearing the date "1631." The Shands, as shown by the grave-slabs and through stones in the churchyards of Essil and Dipple—which were conjoined in 1731 to form the parish of Speymouth—are a family with an old residential and territorial connection with the district; but they do not seem to have had any other personal association with this interesting relic of the art and annals of the first half of the seventeenth century. The only record of it appears to be contained in "the (manuscript) *Speymouth Parish Magazine*" for 1901, a local literary and historical chronicle begun in that year, of which my brother, Mr Alexander Geddie, M.A., Forchabers, lately schoolmaster and still session-clerk of Speymouth, has been and continues to be the "Editor." It is in the

form of a pen-and-ink sketch by the then, and present, minister of Speymouth, the Rev. George Birnie, who has attached to it a note which states that the panel was "taken from the old Kirk of Essil," and was "supposed to be the carved back of a pew belonging to Walter Hay." It is added that "there is only the half of the original back of the pew shown in the drawing"; but there is given, in addition, "a sketch of what seems to be one of the missing panels, obviously carved by the same hand and exactly of the same dimensions as the rest. This belonged to Mr Todd, late of Trochelhill (in the parish). He found it in a dunghill, fifty or sixty years ago (from 1901), in Fochubers." The whereabouts of this fragment is at present unknown.

As will be seen from the photograph (fig. 1), the four panels that have been preserved, and that have found so appropriate a housing, are deeply carved, and bear heraldic, floral, and zoomorphic ornament, including—

(1) A shield, bearing three escutcheons (for Hay) surmounted by a helmet.

(2) A monogram, with the initials "V.H., L.L.," below the demi-figure of a man wearing a ruff.

(3) The inscription—

"Great in
me a clean
heart O God
and renewe
a right
spirit with
in me.
Erexit be
Walter Hay
and L. Innes
His Spons.
1634."

(4) A shield with the three mullets, or sturs, of Innes, and above it what looks like a lady's head-dress.

The missing panel, as drawn by Mr Birnie, was inscribed:

"Blissed
is ye man
yt feare
th ye Lord
and delyght
eth in his
command
ements.
CXII
Psalmc."

The traditional ascription of the fragment to the old Church of St Peter at Essil is certainly erroneous, and it may with some confidence

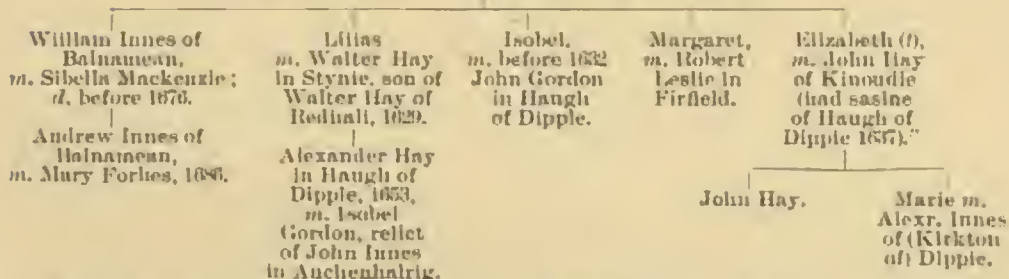
be assigned to the former Church of the Holy Ghost at Dipple, united to Essil some two centuries ago to form the Church of Speymouth, locally known as the "Red Kirk," where service was first held on 25th February 1733. For identification of the "spones" by whom the pew was "erecit," I am indebted to Mr Thomas Innes of Learney, Carriek Pursnivant, who has been at much trouble in examining the relative records of the period, and who writes:

"Alexander Innes of Haugh of Dipple had three, or more likely five, daughters, amongst whom was Lilius Innes, who married, before 1629, Walter Hay in Styne, son of Walter Hay of Redhall (*Moray Sasines*, iii. 235). Another daughter, Elizabeth, married, before 1637, John Hay of Kinoude, and they had sasine of Haugh of Dipple, but whether wholly or a part of tocher is not clear. I do not think the Hays had Redhall long, and probably only in wadsett. Inneses usually held it. I think the pew-back had been considerably larger, and probably the other half showed the arms of the Inneses of Dipple."

He gives the following descent:

"ALEXANDER INNES, burgess in Elgin, had sasine of Balnanean in 1601. m. Marjorie Thomson. He seems to have been still alive in 1631, when he was witness of a sasine to his granddaughter (!) Lilius. He was presumably followed by

ALEXANDER INNES, of Haugh of Dipple, which he acquired in 1631, and who m. Margaret Gordon. He acquired Balnanean from Walter Ogilvie of Redhythe (Fordyce) 1630 (likely a recovery from a wadsett by the previous Alexander), d. before 1647, when his widow was sued for his "lair stane" by Alexander Anderson, mason burgess in Elgin (it cost 50).



It may be noted that, along with a sprinkling of Hays, there were a host of Inneses, proprietors of lands in this corner of Moray in the seventeenth century, including, in addition to those already mentioned, the Lairds of Coxton, Orton, Cotts, Leuchars, and Dunkinty, and that "Walter" and "Lilius" were not infrequent baptismal names. The minister of Essil in 1651, Colin Falconer, who in 1680 became (Episcopal) Bishop of Moray and died 1686, married Lilius Rose, daughter of the Laird of Clava, and through his daughter, who married the Rev. Berowald Innes of Inchstellie, became grandfather of a Lilius Innes. In the generation immediately succeeding 1634 a Janet Innes, daughter of Sir James Innes

of Redhall, married Thomas Pitt, the first Governor of Madras and owner of the "Pitt Diamond," and thus became grandmother of that famous statesman the first Earl of Chatham and great-grandmother of William Pitt. Dipple was one of the earliest Innes acquisitions in Moray of William Duff, father of the first Earl of Fife, whose house, with his arms and initials, still stands on the north side of the High Street of Elgin, opposite the "Little Cross"; while Innes, the chief heritage of the family, represented by that of Innes-Ker, Duke of Roxburghe, was purchased a little later, and is now owned by Mr F. J. Tennant. Fragments of the churches of both Essil and Dipple remain as supports of tombstones. The custom, recorded by the Rev. Lachlan Shaw, the "Historian of Moray," and by others, of carrying the dead "sun-ways" around the circular walls of the churchyard of Dipple survived almost to within living memory. Speymouth Church (there is no graveyard) with the manse, which was headquarters successively of the Jacobite and of the Hanoverian armies in the '45, is within the bounds of the old Dipple Parish. "St Leonard's Well," described as adjacent to the site of the conjoined church, is yet extant, although covered from view, within a stone-throw of the "Red Kirk"; while the farm-house of Styvie is close at hand, and Redhall, of whose manor-house, however, no trace is left, is only a field or two away. It was a small clay-walled "ha' hoose," commanding the ford of Spey opposite Gordon Castle (Shaw's *History of Moray*, vol. i. p. 309).

As to the history of the relic in the intervening couple of centuries no information has been found obtainable. Mr Alexander Geddie writes that "Miss Shand's cousin, who lived next door to her all her life, never saw the panels until after the old lady's death last summer, and had no idea as to how they had got into her uncle's possession. I imagine that when the old church of Dipple ceased to function and began to fall in pieces some of the old parishioners did a bit of salvaging on their own account, and this piece of carved work had the good luck to fall into careful hands, and was preserved for the Red Kirk."

Carved ecclesiastical woodwork, of the period and of heraldic design, is comparatively rare in Scotland, and has in large part been gathered into museums and private repositories. One recalls, as examples *in situ*, the Sandilands pew in the Parish Church of Midcalder (1595), and the Melville pew in that of Burntisland (1606), figured in the *Reports on Ancient Monuments* for Midlothian and for Fife. But more pregnant comparison may perhaps be made, on grounds of local and family associations, with the twelve panels previously adorning the Gardeners' Loft, in the South Aisle, or St Anne's Chapel, of the old Church of Cullen, which were removed for preservation when the church was reno-

vated in 1842, and are now placed in the pillars of the Seafield Gallery, as described by Dr William Cramond in his *Church and Chorchyard of Cullen* (p. 82). Of these panels, four have among their prominent decorations the *fleurs-de-lys* which appear on the Dipple pew-back, and on one of them is the date "1608," with arms—a crescent between three mullets—which Cramond, following Jervise, is disposed to identify as those of Innes, "the crescent being mark for descent from a second son. The letter 'I' on each side strengthens this opinion," as may also the monogram "TAI" on another panel. St Anne's Chapel was founded in 1536 by "Elene Hay," descendant of John Hay, Lord of the Forest of Boyne and of Tullibole, whose arms, three escentcheons, are on the walls. She was mother of John Duff of Muldavit, an ancestor of the Earls of Fife, who, in 1626, sold the lands, which had in a previous century belonged to the Inneses of Innes, to Hay of Rannes.

As indication of the survival to a later date of carved work executed by local craftsmen in this part of the Moray Firth area, Cramond quotes from a contract entered into by Thomas Gordon, carpenter in Fordyce, in 1685, by which he undertook "to erect for Wm. Dunbar in the Ile of Durn and Church of Fordyce, one dask of six pews and one round seatt, covered with one canbe above, handsomlye mullered, with four supporting pillars of the same in good fashione," with a porch, and "bearing his own and his vyfe's armes," for which he was to be paid "40 merks Scots money and two bolls sufficient oatmeal." That this and other forms of Scottish Church art had even by the time of the erection of the Dipple pew-back fallen into dire disrepute with a section of the Presbyterian clergy and laity of the North is, on the other hand, pitifully illustrated by an extract from the same author's *Records of the Kirk Session of Elgin*, in which it is noted that the Rev. Gilbert Ross, from Colmonnell in Carrick, having been translated to the charge of Elgin on 24th September 1640, on 28th December following, in company with Robert Innes, yr. of that Ilk, "he tore down the fine partition screen of the Cathedral, which had remained since the Reformation. This Mr Ross carried home for kitchen fael, but each night the fire got extinguished, and could not be kept in till morning."

III.

FINAL REPORT ON THE EXCAVATION OF THE STONE CIRCLE AT
OLD KEIG, ABERDEENSHIRE. BY PROFESSOR V. GORDON
CHILDE, B.Litt., F.S.A.Scot.

Operations at the Stone Circle of Old Keig were recommenced on 27th June 1933 and completed on 26th July. As before, Mr Mansfield D. Forbes of Clare College, Cambridge, was the leading spirit in the expedition, and the excavators again wish to express their gratitude to Lord Forbes and his tenants at Old Keig, Messrs Mortimer, for permission to work and much practical assistance. Mr Reginald Ross Williamson and Mrs Ross Williamson, Professor S. H. Hooke, Mrs Deedes, and Miss G. Anderson of London assisted in the operations, and the Edinburgh League of Prehistorians co-operated, being represented by Messrs Kilbride-Jones (Hon. Secretary), Kennedy (Treasurer), and Tulloch. Messrs Joe Cormack and Winston Miller of Aberdeen, who were camping in the vicinity, came over on several days and helped us most enthusiastically. Mr Maccombie of Alford was employed for the first fortnight, and, when he fell sick, was replaced by Messrs Angus and Sutherland of Keig. To their loyal and intelligent co-operation the success of the work owes much. Mr J. C. Milne, contractor, of Bents, near Whitehouse, undertook the stabilisation of the pillar stones and gave us the benefit of the practical man's opinion as to the method of their erection.

In 1932 an 8-foot trench at right angles to the Recumbent had been dug across the circle, exposing also half the base of Recumbent and that of West Flanker. In 1933 the whole semicircle south-east of this diameter, as well as the bases of the pillars and the half of Recumbent lying in this area, were stripped down to virgin soil. The stony area near the centre north-west of the 1932 excavation was also fully explored, as well as an area at the base of uprights north-west of Recumbent. Mr Ross Williamson also dug two trenches through the enclosing bank, and by trial pits beyond it succeeded in exposing three of the missing pillar stones of the great circle.

Mr Varley's 1932 survey provided the outline for the accompanying plan, and the line AA established by him as the diameter bisecting Recumbent has been employed as a base line again. Certain uprights, U1, U2, and V1, which were sloping out of the perpendicular last year

are, however, now shown in their correct positions, standing vertically in their original sockets.

As previously stated, the circle lies near the crest of a slight ridge. Its actual crest lies rather to the west of the main axis of the circle under the line of the modern field-dyke. Here in the neighbourhood of stone V3 virgin soil lay 690.50 feet above O.D. or about one foot higher than along line AA. Near the eastern dyke, 32 feet to the south-east, it lies a foot lower than the average along line AA.

The subsoil was an ochre to lemon-yellow concentration layer, covering—generally very thinly—the schist from the decomposition of which it is produced. In places ridges of undecomposed schist crop out through this subsoil, or the subsoil is replaced by a crumbling rock-head. In other places fissures in the living rock were filled with black soil. The subsoil has frequently been penetrated by tree-roots which have also split up the schist ridges. Such disturbances make the identification of holes dug by man peculiarly hazardous.

The clayey layer, described in the previous report, is always sharply contrasted with the light subsoil on which it lies directly. It is technically described as a compaction layer and seems due to trampling on bare subsoil. It is rather greasy to the touch and quite tough to trowel, whereas the undisturbed humus is sandy in texture and relatively loose. The compaction layer everywhere contains small pieces of charcoal, and all the pottery was found in it. This layer is traceable all over the circle, but varies in thickness and tenacity. It is most emphatically marked immediately in front of Recumbent, near the pillars, under the bank and in the undisturbed parts of the central stony area. This is what might have been expected if the layer had been formed by tramping about during the erection of the stones. As noted last year by the writer, the layer is not found outside the circle bank. In two sections Mr Williamson found that it tapers out between 44 feet and 45 feet from the apparent centre of the bank circle (A32). Outside these limits the subsoil passes over gradually without any sharp frontier into the sandy loam of the district. That might mean that the ground vegetation had not been cleared beyond the area delimited by the bank when the circle was erected. Outside the uprights Pc, U1, U2, and P3 the compaction layer extends into the region disturbed by the modern farm-road bank. It will be recalled that in 1932 the compaction layer could be traced for a distance of 9½ feet outside Recumbent, but no farther.

Recumbent.—As in our first section, a bank of large stones was found just under the turf in front of Recumbent and East Flanker. It extended for some 7 feet towards the centre of the circle and nearly to the base of U1. Tree-roots had penetrated in and under the stones. Careful

examination with trowel and broom failed to reveal any structure in these stones which formed a quite shallow bed. They need have had no connection with the original monument, but might represent a later dump or "consumption" (fig. 1).

The stones rested upon a compaction layer, 9 inches to 11 inches thick, containing much charcoal and a few sherds. This layer extends up to the edge of Recumbent and around and beyond the bases of Pe, U1, and U2, and partially covered the packing stones round the base of the



Fig. 1. Recumbent with stony bank in front.

uprights. Thin traces of a compaction layer were also observed right under Recumbent itself. Immediately under the stone was, as observed last year, a layer of very loose black soil containing much charcoal and several large stones that could not have been washed in. High up in the black soil, near the eastern end of Recumbent, a piece of modern chin came to light. In the soil sherds of normal Old Keig pottery were found at $-4\frac{1}{2} \times 2$, $-3\frac{1}{2} \times 1\frac{1}{2}$, $-2\frac{3}{4} \times 3\frac{1}{2}$, $-3 \times 2\frac{1}{2}$, and $-1\frac{1}{2} \times \frac{1}{2}$ (the first figure gives in feet the distance in under Recumbent along line A, the second the distance south-east), and in or under the soil at $-2 \times 3\frac{1}{2}$ and $-3\frac{1}{2} \times 5\frac{1}{2}$. The possibility cannot be excluded that these sherds, like the piece of modern chin, might have worked in from the surface outside the stone, but such an assumption would seem far-fetched.

Just under the inner edge of Recumbent the subsoil dips rather

steeply from 0.80 at $\frac{1}{4}$ (along line A) to 0.40 at - 1, as if a hollow had been scooped out. About 2 feet in from the outer edge ridges of bedrock project through the subsoil, the average level of which continues to fall till it stands at only 0.16 under the outer edge of Recumbent at -6 $\frac{1}{2}$. Farther south-east, about 4 feet from line A, the most pronounced dip



Fig. 2. Recumbent and Flanker from east.

in the subsoil is seen 1 $\frac{1}{2}$ foot in from the edge of the stone. Here, too, ridges of bedrock crop out between 3 and 6 feet in from Recumbent's inner edge. Farther south-east these ridges project still higher to as much as 9 inches above the average level of the subsoil. Beyond the outer edge of Recumbent extensive exposures of undercomposed bedrock are visible in fig. 2.

In no case east of line A does the underside of Recumbent rest on or even touch bedrock or virgin soil. Only at its extreme south-east corner is a block of rock wedged in very tightly between the base of Recumbent and a ridge of bedrock (fig. 2). The undersurface of the Recumbent is

remarkably smooth (fig. 3) and lies almost exactly horizontal at 1'10 to 1'20 above our datum. The pronounced keel observed on the underside of



Fig. 3. Recumbent and Packing round east Flanker.



Fig. 4. Recumbent from south.

the stone at -2½ on line A has entirely flattened out 2 feet south-east of that line. Hence the only support for the eastern and thicker end of

Recumbent is provided by the aforementioned wedger. Ridges of bed-rock seemed to be supporting the stone $2\frac{1}{2}$ feet west of line A in the part examined in 1932 (fig. 5).

East Flanker (Pe) is $9\frac{1}{2}$ feet in total height. About 1 foot above its lowest point (at 689-70 O.D.) the stone is 4 feet 6 inches wide. Below



Fig. 5. Sections of Recumbent along line A, 4 feet to east and $2\frac{1}{2}$ feet to west thereof. ($\frac{1}{8}$.)

this level it tapers off westwards to a point which lies about 1 foot back from the west edge, i.e. that nearest Recumbent. The base is thus roughly triangular. This base rests in an excavation quarried out in bed-rock, about $3\frac{1}{2}$ feet long \times $2\frac{1}{2}$ inches wide, but only some 4 to 5 inches deep. The inner edge of the excavation is alone well marked; the shelving of the bedrock may have made an outer edge originally unnecessary, and none could be traced in the decayed rock. The edge of the upright remote from Recumbent is supported by two wedgers driven in under it on the outside. To accommodate these the edge has been nicked, as shown

in fig. 6. Nearer the apex a wedge, which would also serve as a "skid-stone" to guide the base into the prepared hole, may be seen obliquely tilted on the inner side in fig. 2. The socket hole was filled with loose black earth in which, right under the bottom edge of the pillar, a sherd of typical pottery was discovered. The flanker was further supported



Fig. 6. Base of east Flanker.

on the inside by a carefully arranged packing of large stones resting on, and embedded in, the compaction layer (fig. 3). Though this packing was erected after the pillar was set upright and partly on the compaction layer formed in the process, it must be regarded as an integral part of the monument.

P3, the only pillar of the great circle apart from the flankers still in position, is an approximately prismatic monolith $9\frac{1}{2}$ feet high from base to summit. The wider edge, facing the interior of the circle, is $4\frac{1}{2}$ feet wide at turf level. Farther down it tapers, being $3\frac{1}{2}$ feet wide at the level of virgin soil 688.08 O.D., where the maximum thickness is $2\frac{1}{2}$ feet.

Still lower the stone is yet narrower as the keel at its back tapers off. The pillar rests in a socket, only 9 inches deep, cut in bedrock, and measuring $4\frac{1}{2} \times 3\frac{1}{2}$ feet at its mouth. The eastern edge of the pillar rests against the rock wall of the socket. On the west three wedges support the sloping base of the upright, while two others support it on the south-east. Two of the wedges were found set obliquely, their upper edges



Fig. 7. Pillar from interior of circle.

projecting beyond the rim of the socket, as shown on fig. 8. These would have served as skid stones to guide the base of the pillar into the hole as it was being raised.

The subsoil and rock round the base of the pillar was covered with a compaction layer which was exceptionally tough and 4 inches deep on the inner side. Upon this layer rested a pile of stones and earth deliberately put together to form a packing. The packing merges into the stony bank or dyke on the north-east and extended westward for about $3\frac{1}{2}$ feet towards the stone termed U2. It would not be essential to the stability of the pillar.

Three prostrate stones, undoubtedly once forming pillars of the great circle, were discovered by Mr Ross Willinmson. Px, a flat block of local rock, pointed at both ends and 8 feet 6 inches high, was built into the dyke on the eastern side of the circle. It has now been dragged into the circle area, but the plan shows it as originally exposed (fig. 9).

Pm lay covered with loam, its base being 7 inches and its apex



Fig. 8. Socket of P3.

12 inches above virgin soil. It is a block of local stone, $7\frac{1}{2}$ feet long by $3\frac{1}{4}$ feet wide by 7 inches thick. It, too, tapers to a point at both ends, and its base shows clear tool marks. In the virgin soil, about 2 feet from its base, is a shallow basin-like depression that might conceivably have represented its socket; on the other hand, the pillar may have fallen outward from the bank.

Pn is an obelisk of granite $7\frac{1}{4}$ feet long, 18 inches wide, and 16 inches thick at its base, and 13 inches wide by 9 inches thick 18 inches below its apex. A low, irregular tenon projects from the base at one side.

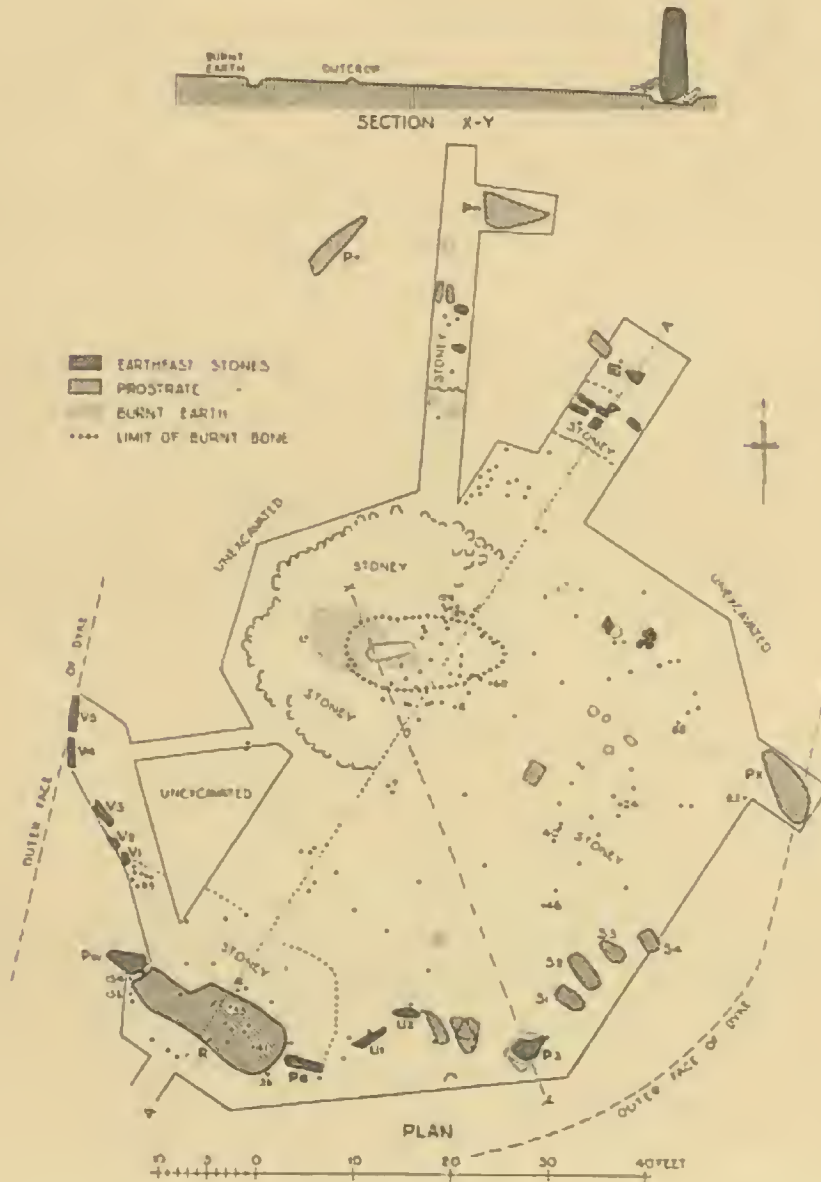


Fig. 9. Plan of Circle.

The stone lay with its apex 6 inches and its base 15 inches above virgin soil. No compaction layer was observed in the vicinity of either stone.

It is possible that the stones marked V4 and V5, and now incorporated in the western boundary of the plantation, were originally two halves of a fourth pillar. Both rest lightly on a thin compaction layer; the pillar itself must have stood outside the plantation.

Two small uprights, U1 and U2, on the east and three, V1, V2, and V3, on the west of Recumbent stand in such a position that they cannot have formed part of the great circle to which the flankers and P3 belong. It has been suggested that these stones have been moved and wrongly set up again. The observations recorded below seem to refute this suggestion.

U1 was embedded in a compaction layer 8 inches deep, from which normal sherds were recovered close to the stone's base. Large stones, which apparently assisted to support the upright on the inner side, were embedded in the same deposit. The stone itself, 5 feet 8 inches high, rests in a groove cut in virgin soil, 25 inches wide and 8 inches deep, and is further secured by a couple of wedgers on the outside, tilted to serve also as skid-stones (fig. 10). Under the stone the groove contained loose black soil identical in texture with the undisturbed subsoil. Beyond the edges of the stone the groove is filled with and covered by the compaction layer. This layer was accordingly formed, at least in part, after the stone was set up; yet, as remarked, it yielded sherds of the usual pottery. Hence the erection of the stone is not later than the period when such pottery was current. U2 is a slab of local stone 5 feet 8 inches high by 2 feet 9 inches wide at its broadest point about 4 feet from the base. The stone tapers to a base and is very top-heavy, being not only wider but also thicker near the top. It stands in a groove, 17 inches wide and 5 inches deep, cut in virgin soil, and was pinned up at the back by two wedges. One of these fitted exactly into a dint in the back of the upright. The stone's base was embedded in a compaction layer on and in which rested several accessory packing stones. Among these in the compaction layer, about 2 inches above virgin soil and immediately in front of the upright, lay a fragment of a lignite armlet and a sherd of the usual pottery. Other sherds were found in the layer at the side of the stone and close behind it.

Between U2 and P3 a large block of local rock, 3 feet long by 28 inches wide by 12 inches thick, was lying on the turf. Under it lay two other slabs measuring respectively 42 inches by 27 inches by 9 inches and 45 inches by 30 inches by 8 inches, parallel to one another (fig. 11). These three stones may have formed uprights or parts of uprights, comparable to V3. However, they lay upon the compaction layer with normal sherds under them, and no sockets could be identified in the subsoil.

V1 is 4 feet 2 inches high and from 9 inches to 12 inches thick. Its average width is 2 feet, but the lowest 1 foot 4 inches is a tenon only 1 foot 2 inches wide. This penetrates three or four inches into virgin soil, the stone being effectively supported by a wedge inserted under its heel against the tenon.



Fig. 10. Stone U1 as found.

V2, 4 feet 9 inches high, rests in a depression in virgin soil only 3 inches deep.

V3 is 5 feet 2 inches high. At the top the stone is 3 feet wide, but it tapers off gradually towards the base, being only 1 foot 9 inches wide at the level of virgin soil. The base continues 1 foot 2 inches into the soil in a very closely fitting socket.

A compaction layer surrounded the bases of all three stones. In this several fragments of one large urn and much charcoal were found between V1 and Pw. A number of large stones were resting on the layer between V1 and Pw (fig. 11). They seemed to constitute a rough wall

similar to the core of the bank. The inner revetment, consisting of boulders 12 inches to 15 inches long, had fallen forward, but it would seem to have run from the south corner of V1 to the edge of Pw nearest Recumbent.

Erection of Pillars.—Mr J. C. Milne of Bents, near Whitehouse, who is experienced in handling large stones, suggests that the pillars were



Fig. 11. Stones V1, V2, and V3.

brought into position on rollers of logs with the aid of wooden levers. A suitable socket would then be dug for the base of the stone. The latter would then be gradually raised by leverage, packing stones being inserted under it after each small lift till the whole was ready to slide into place. The oblique packers, noted at the outer edges of the sockets, would have acted as skid-stones, pressing against the base and guiding it downwards into the socket. He believes that Pe and P3, as also U1 and U2, were brought into place from the inside of the circle. It should further be

noted that all the pillars examined were more or less pointed at the base.¹ P₆ and P₃ were kept vertical by wedges jammed in under the sloping edge of the base. (But cf. the paper by Mr Kilbride-Jones on p. 81 of this volume.)

The Bank.—A segment of a circular bank crosses the wind-break on the north, merging at either end into the plantation boundary. The centre of the circle seems to lie about 32 feet from Recumbent on line A. On the south-east the modern dyke bounding the old road across the plantation forms another segment of the same circle which may be picked up again west of Recumbent. Two sections, each 4 feet wide, were cut through the northern segment in 1933, one (A) parallel to that cut in 1932, the second (E) about 20 feet farther west. In each case the bank was found to be composed of large stones and earth. The compact mass of boulders began in each case 34 to 35 feet from the centre of the circle already mentioned (A32), the highest point coming about 37 feet from this centre. In section A the continuous mass of boulders did not continue beyond 41 feet from the centre, though a couple of large stones were lying 44 feet out. In E the mass of stone extended continuously to 44. At this point a stone 2½ feet high by 10 inches thick was standing on edge at right angles to the diameter. Beside it lay two stones of comparable dimensions that had evidently fallen outwards. There can be little doubt that these stones and those found in a similar position in section A had constituted an outer revetment to the bank. In both sections A and E the compaction layer extended under the bank, but ended between 44 and 45 feet from the centre. The stones of the bank rested upon this layer. In it several normal sherds and a flint-scraper were found under the bank in section E.

The coincidence of the outer edge of the compaction layer and the outer edge of the bank seems to favour the view that the bank formed an integral part of the monument. The stones of the revetment rather resemble those revetting the outer edge of the ring cairn in circles such as Esslie and Old Rayne. If the analogy be relevant, it would seem likely that the pillars P_m and P_n had originally stood very near where they are now lying a few feet outside the bank. On the other hand, our bank might be compared to that in which the pillars are standing in other circles. But some of these banks are certainly either relatively modern or enlarged in recent times. That is true also of the south-eastern segment of our bank which bounds the road across the plantation; here the exposed building is certainly recent. It must be remembered that the bank described as a "vallum of loose stones"

¹ For an explanation of this feature see the separate communication by H. Kilbride-Jones, pp. 83 ff., in this volume.

was mentioned by Logan in 1827, who treated it as part of the monument. Yet its outer edge is precisely 44 feet from the centre, like the "revetment" of the northern segment.

Section E was extended to 60 feet from the centre with a view to revealing an encircling fosse, if any. None such had existed. An irregular depression 4 inches to 6 inches deep, but only about 18 inches in diameter, was, however, found at 51. It might have been a socket for Pn, but was too indefinite to allow of certainty. Near the inner side of the bank in the south-eastern quadrant three stout stones, 4 to 5 feet in length, were exposed lying prostrate upon the compaction layer. It is conceivable that they belonged to an inner revetment of the bank or even stood upon it. Air photographs kindly taken by the Master of Sempoll revealed no trace of an encircling fosse nor yet of a causeway leading to the site of the Crookmore circle.

The Central Burial.—In 1932 minute fragments of cremated human bone and portions of three or more large urns were found immediately west of line A, between 36 and 46 feet from Recumbent. East of line A similar fragments of bone and parts of the same urns came to light, in a strip 4 feet wide, between 38 and 44 feet from Recumbent. All evidently belonged to the same burial or burials, but lay in disturbed soil. Some fragments of the urns lay immediately below the grass.

Farther west of line A we had noticed, but not thoroughly examined, a stony area between 24 and 54 feet from Recumbent. The stones in all cases lay upon the compaction layer and generally appeared quite chaotic. But at the edge of the area nearest Recumbent the stones looked as if they had been set to form a kerb (fig. 12). We therefore already surmised that the stony area might denote the remains of the ring cairn usual in the north-east Scottish circles, and explicitly mentioned by Logan in 1827. We hoped by clearing the east half of the circle to be able to test this hypothesis. But no trace of a continuation of the stony area was discoverable on this side. A strip about 16 feet wide was accordingly cleared west of our former trench. The "kerb" was thereupon disclosed, extending—not without many conspicuous gaps and irregularities—so as to embrace a very rough semi-circle of radius about 15 feet, with its centre rather west of A39.

The supposed kerb consisted of large slabs 15 to 24 inches long or in diameter, and closely resembled the outer wall of a hut-circle such as those described by Professor Forde and myself at Earnshengh, Berwickshire. The long boulders generally stood on end, sloping rather towards the supposed centre. All were firmly planted upon a hard compaction layer 7 inches to 8 inches thick; none reached to virgin soil. Within the space delimited by this kerb we observed a disorderly

collection of boulders, most numerous and closely packed near the kerb and not reaching to the supposed centre of the area. We infer, therefore, that our original conclusion was justified and that we have here the remains of the central cairn mentioned by Logan. The eastern half of this cairn must have been entirely removed, presumably for building purposes; even the remaining segment looks disturbed and denuded.

Under the stones came a compaction layer, except in the disturbed area on the east, explored last year. Under the layer we exposed an irregular area over which the subsoil had been baked to a bright brick



Fig. 12. "Kerb" of central ring cairn exposed in 1932.

red by intense heat. The area extended from the patch discovered in 1932 close to the centre of the cairn south-west for about 13 feet and was $6\frac{1}{2}$ feet wide at its broadest part. The baking seemed to have been most intense along the north-western edge, where the red colour penetrated fully 2 inches into the subsoil.

Near the cairn's centre the baked patch is interrupted by a trench, about $4\frac{1}{2}$ feet long by $2\frac{1}{2}$ feet wide by 8 inches deep, running very nearly east and west. This trench seems to have cut into the baked subsoil. It contained dark earth, charcoal, and fragments of incinerated bone. Other fragments of burnt bone were found in the compaction layer over the burnt patch. In fact, the burnt bone extends continuously from this region into those already mentioned as yielding bone in 1932 and in the earlier stages of the present campaign. All fragments

presumably belong to the same deposit and accordingly represent the central burial in our monument.

No pot-sherds were discovered over the undisturbed part of the burnt patch. The urns discovered this year and last must therefore have lain near where we found them, towards the eastern side of the burnt patch near the centre of the cairn and the trench. Perhaps, therefore, they should be regarded rather as receptacles for food- and drink-offerings to the departed than as urns for his ashes. They may originally have lain on the bare earth or in the trench, which looks suspiciously like a grave.

The foregoing observations prove that the pillars at Old Keig, as elsewhere in Aberdeenshire, did once surround some sort of central cairn. The latter had covered or enclosed a burial by cremation accompanied by the pottery vessels now recovered. This interment, centrally situated in the monument, must be regarded as primary and revealing its purpose. The vessels found in the immediate vicinity of the interment must consequently be accepted as evidence of the monument's age.

It has been pointed out that the stones, ascribed to the cairn, rested on the compaction layer and not on virgin soil. The compaction layer, formed by trampling on the subsoil, must accordingly have been in existence before the cairn was piled. In other words, the circle of uprights, the erection of which would involve a great deal of trampling about, must presumably have been set up before the cairn. This is quite in order. Just as a Pharaoh would build his pyramid before his death, so the barbaric Aberdeenshire chief would have the enclosure which was to guard his ashes completed during his lifetime. The cairn could, however, only be heaped over the ashes after the demise of the chief.

In view of its relatively small size, we hesitate to assert that the burnt patch really marks the site of the pyre on which the chief was burnt. If it does, we must assume that the earth at the base of the pyre was ceremonially cleared, the body then burned, and a grave eventually dug in the centre of the circle at the edge of the pyre. Perhaps before the desecration in the seventeenth century mentioned by Garden, the greater part of the ashes and the funerary vessels had actually reposed in this grave trench.

It should, in conclusion, be noted that whereas this grave lies at worst only 4 feet from a possible centre for the circle of pillars, it cannot be regarded as the centre of the bank-ring which must lie about 8 feet to the south of it. This may mean that the bank is not original, or that its circumference was inaccurately traced.

Other Features.—Two small patches of baked earth were observed in other parts of the circle stripped this year and are marked H on the plan. In each case the fire has affected an area barely 3 feet square, and the reddening of the subsoil is quite superficial—really a thin film on the surface. There were always small fragments of charcoal round the edges of the baked patch, but no accumulation of ash over it. Any fires kindled at these points can, therefore, only have burned for a short time. The baking of the subsoil, however, affords additional proof that the turf or other ground vegetation had been removed within the area of the circle.

In view of the shallow deposit of subsoil covering bedrock, post-holes were not to be expected. Several approximately round depressions in the subsoil, generally about 1 foot across but only 4 inches to 6 inches deep, were, however, discovered by Mr Forbes in the north-eastern quadrant. They make no discoverable pattern and may be due to tree-roots. In one such depression, which was double, stood a stone, 2 feet high, with its base embedded in the compaction layer.

An extensive area of large loose stones occupied squares 26 to 38 by 16 to 26 of the south-eastern quadrant. The surface of the area was carefully exposed with trowel and broom without disclosing any pattern. All the stones lay quite loosely above the compaction layer; they are evidently due to secondary dumping.

On the plan the find-spots of individual sherds are marked by separate dots, except between A36 and 46, where the relics were too numerous to record in this manner. Rim-sherds alone are numbered. Beyond the conspicuous concentrations near the centre and in front of Recumbent, the distribution of sherds would seem to be entirely fortuitous. It is, however, significant that sherds are scattered about over the whole area. All sherds belong to the same general kind of ware, identical with that described in 1932. Additional examples of the characteristic flattening of the rim are shown in fig. 13. It should be noted that several pieces of wheel-made pottery, mediæval or later, came to light during the excavation, all immediately under the turf; none lay in or even on the compaction layer from which the bulk of the relics came, nor bore any relation to significant parts of the monument. The find-spots of these intrusive sherds are marked with a cross.

As previously remarked, the pottery from the compaction layer agrees on the one hand with the fabric assigned to Iron Age A in England, on the other with that found by Miss Benton with Late Bronze Age objects at Covesea. The remaining relics, recovered this season, would be appropriate in a similar context. They are:

Segment from a rather flat lignite urnlet, $\frac{1}{2}$ inch wide and about

4 inches in diameter externally. It is split so that the section cannot be accurately determined, but the inner edge was flat, the outer convex.



H.E.K.J., DEL., 1933.

Fig. 13. Pottery Rims. (1.)

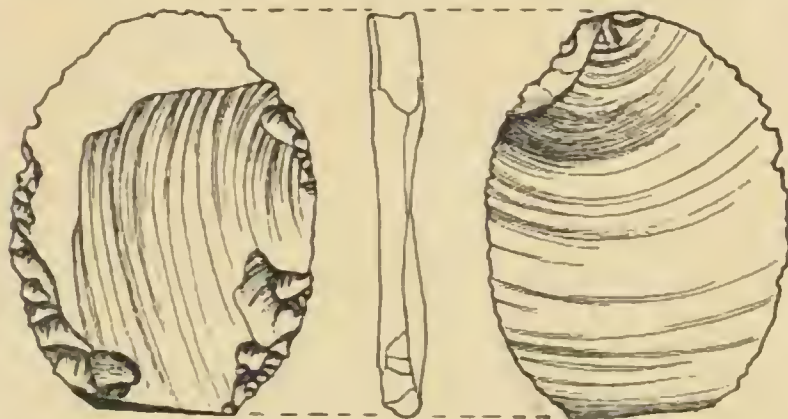
Lignite amulets are foreign to the pure Bronze Age, but occur already with Late Bronze Age objects in Heathery Burn Cave, Co. Durham.

Two small flint-scrapers and one worked flake.

A minute fragment of a flint-blade or arrow-head, worked very thin by pressure flaking on both faces; the outline cannot be determined.

A small piece of pumice.

The excavations of 1933 entirely confirm the conclusion reached in 1932 that the monument must be dated by the pottery then discovered. A large area has now been examined; but apart from superficial intrusions, always lying above the compaction layer, the pottery is



H.E.K J., DEL., 1933.



H.E.K:J, DEL.

Fig. 14. Worked Flint and Pot Bases. (1.)

thoroughly homogeneous (except for the very minute sherd found in 1932 and then diagnosed as possibly beaker). Sherds of this ware were found generally in close relationship to constituent parts of the monument. The sherd found under east pillar cannot well be a late intruder. The sherds found under Recumbent and in the packing supporting Pe, U1,

and U2 are scarcely more likely to have got there after the completion of the monument. Less emphasis can be laid on sherds sealed under the bank, in view of the doubts expressed as to its age. Only one burial could be identified, and it occupied such a position that it must be regarded as primary. Though it had admittedly been disturbed, the broken vessels found among the ashes must have been associated with this primary interment. Had our pottery been due to later occupants of the site, we should not expect to find it pure and concentrated in the centre and round Recumbent.

BOTANICAL REPORTS.

Mr M. Y. Orr of the Royal Botanic Garden and Dr I. M. Robertson of the Macanley Institute for Soil Research have been kind enough to examine respectively the charcoal found in the compaction layer and the pollen in the soil on the site. It will be noticed that in the compaction layer 40 per cent. of the wood came from hazel, 25.2 per cent. birch (*Betula*), 24.7 per cent. willow (*Salix*) or poplar, 7.6 per cent. alder (*Alnus*), and only 5.2 per cent. oak. In comparing these figures with the results of the pollen analyses of the later deposit of soil, it must of course be remembered that the former figures refer exclusively to wood used and burned by the "Late Bronze Age" people, while the pollen is derived from any trees growing in the vicinity in subsequent ages.

Report on Charcoal Samples from Old Keig.

All the material appears to be charred by fire and not merely carbonised by decay. As it was quite impossible to prepare it for microscopic examination, all identifications are based on the macroscopic appearance of the broken surface. It has not been possible, therefore, to separate such closely allied woods as Willow and Poplar, nor to be absolutely certain regarding Alder and Hawthorn.

255 Samples from the Stone Circle of Old Keig.

Alder	16 doubtful	Oak	11
Birch	53	Willow and Poplar	52
Hazel	84	Not known	39

M. Y. ORR.

ROYAL BOTANIC GARDEN,
EDINBURGH.
24th August 1933.

Pollen Analyses: Report on Samples taken from Stone Circle at Old Keig.

Samples of the soil from the various layers at Old Keig were collected near the Recumbent Stone inside the Circle and taken for laboratory analysis.

Three distinct layers were examined, viz.:-

1. The surface layer, sampled at 7 inches.
2. The "occupation" layer, sampled at 12 inches.
3. The unaltered subsoil, sampled at 20 inches.

Pollen analyses were carried out in all of the above samples.

Sample 1 contained: *Alnus* 38 per cent., *Betula* 36 per cent., *Pinus* 12 per cent., *Quercus* 12 per cent., and *Salix* 2 per cent. In addition to the tree pollen, the following were present: *Graminæ* 46 per cent., *Poly-podium* 34 per cent., *Cyperaceæ* 28 per cent., *Ericaceæ* 56 per cent. (two types), expressed as percentages of the tree-pollen.

Much of the pollen appeared to be quite fresh, and could quite well have been washed from the surface by way of cracks.

Sample 2 contained much burnt material but very few recognisable pollen grains. A few fresh grains of *Ericaceæ* and *Graminæ* were observed, but had probably come from the upper layer.

Sample 3 contained much burnt material but no pollen.

It must be emphasised that in mineral deposits the interpretation of pollen analyses is extremely difficult, since material from upper layers is often carried downwards, giving an entirely false idea of the true flora associated with the lower layers.

IAN M. ROBERTSON.

9th January 1934.

IV.

SCOTTISH STANDING MAZERS. BY COMMANDER
G. E. P. HOW, F.S.A.Scot.

From the thirteenth to the sixteenth century the most common form of drinking vessels appear to have been mazers.

They were, as a rule, made of maple wood, well known for its durability and the fact that it has a beautiful spotted grain. Hence the word Mazer, derived from the old German "Mâsä," meaning a spot. The mazers in use amongst the poorer classes were, as a rule, plain bowls, but wealthy families had their mazers ornamented with silver and silver gilt mounts, enamelled medallions, and occasionally highly ornamented covers with sometimes a long stem or foot.

A very full description of English mazers may be found in Sir Charles Jackson's *Illustrated History of English Plate*, in which he states that about sixty authentic mazers are known to have survived to the present day. He divides them into the following groups:—

1. Mazers from probably the fourteenth and early fifteenth centuries. Bowls generally deep, with plain and narrow bands. Prints various.

2. Mazers from circa 1450 to circa 1540. Shallow bowls, with characteristic bands, and prints divisible into (a) plainly moulded, (b) those set on rayed and fringed plate.

3. Elizabethan Mazers. Bowls, bands and prints much the same as in Group 2, but with metal straps connecting the band and foot.

He further states that of standing mazers in which the foot is original, only three examples have survived. One at Pembroke College, Cambridge, another at Corpus Christi College, Cambridge, and a third at All Souls College, Oxford.

On page 632a, however, he illustrates and fully describes the Craigievar mazer, stating that it was not brought to his notice until after the rest of the chapter on mazers had been printed. From this I think one can assume that he was unacquainted with the remaining now known Scottish standing mazers.

The only recorded Scottish mazer of earlier date than the middle of the sixteenth century, and at the same time the only Scottish mazer in any way similar to the early English mazers, is the Bannatyne or Bute mazer, illustrated in figs. 1 and 2 of this article. This mazer, which has been most fully described by J. H. Stevenson, M.B.E., K.C.,

F.S.A.Scot., in the *Proceedings of the Society of Antiquaries of Scotland*, vol. lxx. (vol. v., Sixth Series), Session 1930-1931 (pages 217 to 255), I do



Fig. 1. The Bute Mazer.



Fig. 2. Print of the Bute Mazer.

not propose to discuss further than to say that Mr Stevenson has, in his exceedingly interesting treatise, definitely ascribed the print to between the years 1314 and 1318, and the silver mounts, which are unmarked, to the first half of the sixteenth century.

We now come to the Scottish standing mazers, three of which, the St Leonard's mazer (so-called), the St Mary's mazer, and the Galloway mazer, were known to the late Alexander J. S. Brook, F.S.A.Scot., whose exceedingly important research work into old Scottish plate has been the foundation of all later works on this subject.

These three mazers are described in that very fine work, *Old Scottish Communion Plate* by the Rev. Thomas Burns.

The St Mary's Mazer (illustrated by figs. 3 and 4).

Dimensions:

Diameter of bowl	.	.	.	8½ inches.
Depth	.	.	.	2½" "
Height	.	.	.	6½" "
Diameter of foot	.	.	.	4½" "

This mazer, fully described by the Rev. Thomas Burns, is of maple-wood, mounted with a narrow silver border $\frac{1}{8}$ inch deep. It bears no inscription. The print inside the bowl is 4 inches in diameter and has inscribed on its border the Vulgate text of John i. 17:

"LEX · PER · MOISEN · DATA · EST · GR̄TA · ET · VERITAS ·
PER · IESU · CHR̄M · FACTA · EST · 10. I."

A shield in the centre has engraved on it the following passage from the Vulgate text of 1 Corinthians x. 31:—

"SIVE · MADVCATIS · SIVE · BIBITIS · VEL · ALIVD · QVID ·
FACITIS · OIA · IN · GLIAM · DEI · FACITE ·
I Corin. 10. 1567."

Surrounding the shield is inscribed:—

"COLLEGIV · NOVVM · SCTE · ADREE."

It bears the Edinburgh town mark, the maker's mark of Alexander Auchinleck, and the Deacon's mark of Thomas Ewing, who held that office from 1552 till 1556, and again in 1561. From this fact it is evident that the mazer was actually made prior to the date 1567 on the print, and though it is possible that it was made during the first period of Thomas Ewing's deaconship it would seem more probable that it was made during his last period in 1561. In any case the mazer cannot definitely be ascribed to a date prior to 1561, though it is certainly not later than that date, and as such its interest and value are greatly enhanced by the fact that it is the oldest recorded piece of properly hall-marked Edinburgh silver plate. This mazer is somewhat similar to the Fergusson mazer described below, but it is not in nearly such a fine state of preservation.



Fig. 3. The St Mary's Mazer.



Fig. 4. Print in Bowl of the St Mary's Mazer.

The Fergusson Mazer (illustrated by figs. 5, 6, and 7).

Dimensions :

Diameter of bowl	.	.	.	8 $\frac{1}{2}$ inches.
Depth	.	.	.	3 $\frac{1}{2}$..
Height	.	.	.	7 $\frac{3}{8}$..
Diameter of foot	.	.	.	5 $\frac{1}{2}$..

This mazer, the property of General Sir Charles Fergusson of



Fig. 5. The Fergusson Mazer.

Kilkerran, illustrated by fig. 5, bears a strong resemblance to the St Mary's College mazer, but is in a far finer state of preservation. The marks, as illustrated by fig. 6, are those of the maker—Adam Craige—the Edinburgh town mark, and the Deacon's mark of James Mosman who was Deacon in 1576.

The print bears the arms of Fergusson (on a chevron between three boars' heads, two and one, a mullet) impaling Durham (on a fesse three mullets), and the initials DF and ID (David Fergusson and Isobel Durham his wife). Surrounding the coat of arms is the inscription :



Fig. 6. Details of Fringe and Marks on Band of Fergusson Mazer.



Fig. 7. Print of the Fergusson Mazer, showing Marks.

Quid · Habes · Quod · Non · Accepisti · Si · Accepisti ·
Quid · Gloriaris · I · Corin · 4 ·

(What hast thou that thou didst not receive?
Now if thou didst receive it why dost thou glory?)

It is dated 1576, and with the Deacon's mark, this mazer can definitely be ascribed to that year.

Family legend records that this mazer was a gift from King James VI., afterwards James I. of England, when aged ten, to his tutor David Fergusson, who was born about 1525 of an Ayrshire family which migrated to Dundee. He began life as a glover, but preferring a more intellectual career, gave up the trade and was educated for the Church. In 1560, he was inducted as first Reformed Minister of Danfermline and subsequently became tutor and chaplain to the young King James VI. (afterwards James I. of England), who in his early days lived chiefly at the Palace of Danfermline.

For many years lost, this mazer was eventually rediscovered in an old hat box, which, with other old boxes, was being thrown into an incinerator.

This and the previously described St Mary's mazer are the only recorded examples of plain Scottish standing mazers, and, as can be seen from the photographs, are very similar in design.

The Tulloch Mazer (illustrated by figs. 8, 9, and 10).

Dimensions :

Across bowl	.	.	.	$7\frac{1}{8}$ inches.
Height	.	.	.	$7\frac{1}{8}$..
Across base	.	.	.	$4\frac{5}{8}$..
Across boss	.	.	.	3 ..
Depth of bowl	.	.	.	$2\frac{3}{8}$..

The Tulloch mazer I consider to be the finest and most important of all the Scottish mazers. It is at present the earliest hall-marked definitely ascribed example of Scottish silver. The mounts are of silver-gilt, the band being decorated with engraved scroll foliage and human figures. The stem of the cup is chased with floral ornament, the outside edge of the foot being ornamented with oval embossed lobes. It bears two marks on the upper rim as illustrated in fig. 9, the mark on the right, the Stag Lodged with the cross between the antlers, being the town mark of Canongate, where, at that time, the goldsmiths to Holyrood Palace and a large number of the nobility of Scotland were mostly working. The other mark is IG in monogram. This mark, which is also upon the Galloway mazer described later, has previously been erroneously ascribed to James Crunfaird of Edinburgh whose mark IC in monogram is somewhat similar, though in a totally different shield. Thanks to the very important work recently carried out by Miss Wood on the old Canongate records, the information from which, with regard to the goldsmiths of the Canongate, she has been kind enough to place at my disposal, I am now able to state that from these records, in 1569,



Fig. 8. The Tulloch Mazer.



Fig. 9. Engraving and Marks on Band of Tulloch Mazer.



Fig. 10. Print of the Tulloch Mazer.

there were six goldsmiths working in the Canongate, amongst them James Gray and one John Acheson, styled "Maister Cungyear" (that is Master Coiner) to the King. There can be no doubt that this James Gray, who designed the memorial to the Regent Murray in St Giles' Cathedral, was the maker of both the Tulloch and the Galloway mazers, the finest and most beautiful of all the Scottish standing mazers, and amongst the most valuable individual items of the goldsmiths' craft still in existence to-day.

The print of the Tulloch mazer is of very exceptional interest, having been, as was the print of the Bannatyne mazer, originally enmmelled (see fig. 10).

The arms are those of Tulloch of Tannoehy, with the inscription: "HONORA DEUM EX TOTA ANIMA TUA," and the date 1557, which places this mazer as having been made when "Bloody" Mary was on the throne of England, and Scotland was under the Queen Mother, Mary of Lorraine, Mary Queen of Scots at the age of seventeen still being resident in France.

This superb mazer was on view at the Elizabethan Exhibition held at 22-23 Grosvenor Place, S.W. 1, from 26th January to 15th March 1933, at which time it had never been out of the Tulloch family, though it has recently passed through the author's hands.

The Craigievar Mazer (illustrated by figs. 11, 12, and 13).

Dimensions:

Diameter	.	.	.	.	9 inches.
Depth of bowl	.	.	.	.	2½ "
Height	.	.	.	.	8½ "
Diameter of foot	.	.	.	.	5½ "

This mazer, fully described and illustrated as previously stated by Sir Charles Jackson on page 632a of his *Illustrated History of English Plate*, bears the maker's mark of James Craufnird. This is the mark that has been confused with James Gray of the Tulloch and Galloway mazers. It also bears the Edinburgh town mark and the Deacon's mark of George Heriot, Deacon for the last time in the year 1591. Combined with the fact that the maker, James Craufnird, was not admitted until 7th October 1591, this definitely ascribes this mazer as having been made at the end of 1591, during the first year of James Craufnird's work as a freeman.

This mazer, though not silver gilt, bears a striking resemblance to the earlier Canongate mazers by James Gray, and must rank with them, both in workmanship and design, as amongst the most beautiful examples of the work of the goldsmiths of all time. It can be seen from the



Fig. 11. The Craigievar Mazer.



Fig. 12. Marks on Band of the Craigievar Mazer.

illustration how very similar are these three mazers, the engraving by James Craufuird, however, being slightly softer than that of James Gray. The design on the rim of this mazer is a running leaf pattern, with a gilly flower, roses and acorns, amongst which at intervals in the following order are, a stag, hound, peacock, squirrel, hare, hound, chough, fox, bear, monkey, fox, popinjay, lion, and a bear standing on



Fig. 13. Print of the Craigievar Mazer.

his hind legs and leaning on a staff. The print, 4 inches in diameter, bears the arms of Petrie of Portlethen impaling Forbes of Craigievar.

This mazer is believed to have descended in the Forbes-Sempill family from Anna, second daughter of Sir William Forbes, Bart., of Craigievar, who married Robert Petrie, Provost of Aberdeen in 1665, whose arms are engraved on the print, from which family it was acquired by Mr Sydney Letts of Gt. Russell Street, who sold it to Mr John A. Holms, from whom it passed to its present owner.

The Galloway Mazer (illustrated by figs. 14 and 15).

Dimensions:

Diameter	8½ inches.
Height	8½ "

This mazer, the property of the Earl of Galloway, is very slightly larger than the Tulloch mazer.

As can be seen from fig. 14 it is very similar to the Tulloch mazer, and is also silver gilt, the main difference being in the decoration of the rim, which lacks the figures of the Tulloch mazer, having instead three shields—on one, the arms of Archibald Stewart, Lord Provost of Edinburgh, and of his wife, Ellen Acheson; on another an eagle



Fig. 14. The Galloway Mazer.

displayed, the Acheson crest; and on the third, the initials AS·EA for Archibald Stewart and Ellen Acheson.

Archibald Stewart was the younger brother of Sir James Stewart, 1st Lord Doune and ancestor of the Earls of Moray. He died without issue and was succeeded by his nephew, James Stewart, whose daughter, Barbara Stewart of Burray, married William Stewart of Mains, brother of the 1st Earl of Galloway. The Stewarts of Burray died out in the middle of the eighteenth century, when the Burray baronetcy devolved

on Alexander, 6th Earl of Galloway. It was probably at this time that the mazer came into the possession of the Earls of Galloway.

The arms show the fesse chequy of the Stewarts, conjoined with the Lion of Scotland and the saltire and roses of Lennox, marking descent from the princely house of Albany through a natural son of Stewart of the Lennox, heir of Murdoch Stewart, Duke of Albany and Regent of Scotland at the time of James I. of Scotland.

The proportions, as can be seen from the measurements and also from



Fig. 15. Ornamented Print of the Galloway Mazer.

the photograph, are slightly different to those of the Tulloch mazer, the diameter of the Tulloch being equal to the height, whereas in the Galloway the diameter is greater than the height.

The silverprint inside the bowl is $3\frac{1}{2}$ inches in diameter, and the initials AS·EA again appear within the decorated border. It is riveted to the stalk, as is also the print in the Tulloch Mazer, by four silver pins, and on it are engraved the words:

Proverb 22 Ane · good · mane · is · to · be · chosen ·
 above · great · riches · and · loving · favour · Is ·
 above · silver · and · above · moste · fyne · golde. 1569

this date being twelve years later than the Tulloch mazer. The marks on the rim are identical with those on the Tulloch mazer, being the Stag

Lodged, which is the Canongate town mark, and IG in monogram, the mark which I now ascribe to James Gray.

The St Leonard's Mazer (illustrated by figs. 16 and 17).

Dimensions:

Diameter of bowl	.	.	.	$9\frac{1}{2}$ inches.
Depth	.	.	.	$3\frac{1}{8}$ "
Height	.	.	.	$7\frac{1}{8}$ "
Diameter of foot	.	.	.	$5\frac{1}{2}$ "



Fig. 16. The St Leonard's Mazer (so-called).

This so-called mazer, illustrated in figs. 16 and 17, although unmarked, is probably of Scottish origin, and it has been suggested by the Rev. Thomas Burns that it may possibly be the one specifically mentioned in the Inventory of the Chamber in St Leonard's College, allotted to the Principal in 1544, where are mentioned: "2 silver pieces, one maizer wt common cups and stoups" (Lee's *History of the Church*, vol. ii. p. 352).

The bowl is of silver, and though this may have been a replacement, due to the original bowl of wood having been broken through accident,

as has also been suggested by the Rev. Thomas Burns, it is undoubtedly of early date, and I consider it to be the original bowl.

It is mounted with a silver band, $1\frac{3}{16}$ th inch deep, which is fixed to the silver bowl in the same manner as if it had been wood, the bowl itself being riveted on to the foot by silver pins. The centre of the bowl, which has no print, is raised as shown in the photograph, as are also some of the seventeenth-century cups.



Fig. 17. Inside of the Silver Bowl of the St Leonard's Mazer, showing the raised Centre and the Silver Pins fastening it to Foot.

Without further evidence, it is impossible, accurately, to date this mazer or cup, though if proof could be found that it was actually the mazer mentioned in 1544, it would be the earliest of the Scottish standing mazers.

In general form, however, it seems more closely related to the seventeenth-century large Communion Cups, such as that at Old Greyfriars, Edinburgh, 1633, or at St Ninian's, Stirling, 1685, or many others illustrated in *Old Scottish Communion Plate*. To show this

resemblance, my final illustration is of the St Leonard's cup, a typical example of these large seventeenth-century Scottish Communion cups, whose general form was evidently based on the earlier standing mazers, and to which group I personally ascribe this so-called mazer.



Fig. 18. The St Leonard's Cup, Edinburgh, circa 1681.

The St Leonard's Cup (illustrated by fig. 18).

The St Leonard's cup bears the Edinburgh hall-mark with the Deacon's punch of Edward Cleghorne, Deacon in 1663-1665, 1671-1673, and 1679-1681, and the maker's mark of William Law, admitted in 1662, and is inscribed:

THIS · CUP · IS · DEDICATE · TO · THE · USE · OF · THE ·
HOLY · TABLE · IN · ST · LEONARD'S · CHURCH · IN ·
ST · ANDREWS · BY · A · DEVOUT · WIDOW · AS · A · FREE ·
WILL · OFFERING · FOR · THE · RETURN · OF · PRAYER ·
UPON · THE · XIII · DAY · OF · APRIL · MDCLXXXI ·

From the inscription it would appear probable that it was actually made during the last period of Edward Cleghorne's deaconship.

A comparison with the photograph of the St Leonard's "mazer" will show the strong similarity of line to which I refer, when suggesting that the St Leonard's "mazer" is actually an early seventeenth-century Communion cup in original condition, and should be classed with the other big Scottish cups as seventeenth-century Scottish cups or chalices of "standing-mazer" form.

On those very rare occasions when one of these Scottish mazers appears in the sale room, it invariably realises a very large sum of money. (The Bannatyne mazer fetched £10,000 at Messrs Hurcomb's, and the Fergusson mazer reached £6100 at Messrs Sotheby's, at which figure it was withdrawn.) But quite apart from this fact, many people will agree with me that these standing mazers are amongst the most beautiful objects ever produced by the goldsmiths of this or any other country, and that they show no sign of foreign influence, either from England or the Continent.

MONDAY, 14th May 1934.

BRIGADIER-GENERAL SIR ROBERT GILMOUR, BART.,
C.B., C.V.O., D.S.O., Vice-President, in the Chair.

A Ballot having been taken, the following were elected Fellows:—

ALAN CHAPMAN, M.A. (Cantab.), Torsoyce, Stow, Midlothian.
PIERCE MIDDLTON, 6 Ramsay Gardens, Edinburgh.

There were exhibited by T. MAULE GUTHRIE, F.S.A.Scot.:—

A Flanged Bronze Axe, with wide triangular flanges and no stop-ridge, measuring $4\frac{3}{4}$ inches in length, $1\frac{1}{8}$ inch across the cutting edge, and $1\frac{1}{4}$ inch across the wings, found amongst blackened sand near the right bank of the river North Esk, Angus, on the farm of Ballownie, near Brechin, about 600 yards south-south-west of the farm-standing.

It was covered with a rough dirty green patina.

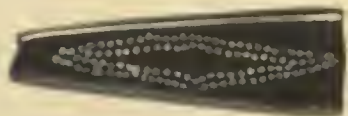


Fig. 1. Terminal Plate of Jet
Necklace. (4.)

A triangular terminal Plate (fig. 1) and a bugle Bead of Shale, the remains of a Necklace, and a slug-shaped Knife of greyish-yellow Flint, found in a short cist, about one hundred years ago, near the Den of

Lenchland, Brechin. The plate is flat and triangular in shape. It is perforated longitudinally by two perforations at the broad end which meet at the other, and it is decorated with an elongated lozenge formed by double rows of punctulations. On the under side is a small hole running into one of the perforations. It measures $1\frac{1}{2}$ inch in length, $\frac{1}{8}$ inch across the broad end, and $\frac{1}{4}$ inch in thickness. The bead is $\frac{3}{8}$ inch long, and the flint knife $1\frac{1}{2}$ inch. Accompanying the relics is a letter of a very young boy to his father, a minister in Old Aberdeen, dated 5th December 1837, which runs: "I send along with this a bead and flint stone which were found in a stone coffin near the Den of Lenchland, the coffin was only 3 feet long and the body, which had been that of a tall person, was put in double, there was a whole string of beads in the coffin and also a cap, as the men called it, containing some flints a flourish, but they broke the cap, we have a bit. . . ." In all probability the cap was an urn of the food-vessel type. Wooden bowls such as those used by farm-servants for making brose are still called brose-caps in the north-east

of Scotland, and their shape approximates to that of some food-vessels. The shale plate is unusually narrow in proportion to its length.

The following Donations to the Museum were intimated, and thanks voted to the Donors:—

(1) By The Most Honourable THE MARQUESS OF LOTHIAN.

Cinerary Urn (restored) and base and wall fragments of another, found at Monkclaw, near Jedburgh. (See previous communication by A. J. H. Edwards, F.S.A.Scot.)

(2) By EVANDER MACKAY, J.P., F.E.I.S., 15 Wilton Road, Edinburgh.

Beaker of reddish-brown Clay, containing some crushed stone, measuring $7\frac{1}{2}$ inches in height, $6\frac{1}{2}$ inches in diameter at the mouth and at its widest part, and $3\frac{3}{8}$ inches across the base (fig. 2). The wall is $\frac{1}{16}$ inch thick, the top of the rim being rounded. The urn is of unusual shape, the bulge being at about one-third of its height, and the part between it and the rim almost vertical. The decoration on the exterior is crude and has been incised with a pointed tool. It is arranged in three irregular zones, at the top, at the widest part, and just above the base. The highest consists of five and six transverse lines, with short oblique lines between them in places, below which are rows of oblique lines, one to the left and two to the right. The central zone consists of six transverse lines with short strokes slanting from right to left between the third and fourth, and fourth and fifth lines. The bottom band consists of four transverse lines. Found by the donor about twenty-two years ago, in a short cist in a gravel pit on the roadside at Woody Knowe, Strathnaver, about eleven or twelve miles from Bettyhill.



Fig. 2. Beaker from Strathnaver, Sutherland.

(3) By Professor V. GORDON CHILDE, B.Litt., F.S.A.Scot.

Stone Pot-lid, measuring $3\frac{1}{2}$ inches in diameter, found at the quarry, Traprain Law.

(4) By D. P. MACLAGAN, W.S., Secretary.

Three Casts: (1) of part of a rock bearing a central cup surrounded with three rings, the outer 10 inches in diameter, and a smaller cup in the line of the central ring, at the west march, Cairnholy, Stewartry of Kirkendbright; (2) of part of a rock bearing two parallel rows of cup-marks, seven in each, near the sheep-fank at Cairnholy; (3) of a single cup-mark surrounded by two rings with a duct leading from the cup through them, on a loose stone in a dyke on Barholm Hill, Kirkdale, Stewartry of Kirkendbright.

(5) By The Rt. Hon. WALTER RUNCIMAN, P.C., M.P.

Cast of parts of the head and the shaft of a Cross, much worn and broken. The head portion shows a hunting scene with two hounds attacking a deer, and other designs of indeterminate character; it measures 24 inches by 14½ inches. The fragment of the shaft bears a foliaceous design with leafage springing from both sides of a wavy central stem, and on the left margin is a narrow border with paterae. It measures 34½ inches by 11½ inches. From St Donnan's, Eigg, Inverness-shire.

(6) By J. BOLAM JOHNSON, F.S.A.Scot.

Turnspit of Brass, measuring 12½ inches in height.

(7) By JOHN A. FAIRLEY, Lauriston Castle, Davidson's Mains, Edinburgh.

Two Scotch Pebble Brooches, the first with a silver frame of coiled wire, measuring 2½ inches by 2⅛ inches, and the second with a very light gold frame, measuring 2⅞ inches by 2 inches.

Gold Bracelet set with Scotch Pebbles, with a pendant-locket in the form of a padlock, containing a plaited lock of hair.

(8) By THOMAS HAIG, Birkhill, Fife, through J. TENNANT GORDON, O.B.E., J.P., F.S.A.Scot.

Denarius of Tiberius, found at the Roman Fort of Newstead.

(9) By J. TENNANT GORDON, O.B.E., J.P., F.S.A.Scot.

Grant of Robert III., Dumbarton mint, unpublished variety of Burns' *Coinage of Scotland*, vol. i., p. 327, Nos. 54 ff.

(10) By the Rt. Hon. LORD HAMILTON of Dalzell, Dalzell, Motherwell.

Highland Dirk made from a Ferara sword blade, measuring 18 inches long, the wooden-grip bearing carved interlaced designs.

(11) By WILLIAM BROUGH, F.S.A.Scot.

Set of miniature Lowland Pipes, preserved by an old Highland family.

(12) By F. C. MEARS, F.R.I.B.A., M.T.P.L., 3 Forres Street.

Copper Finger-ring, with a Maltese Cross on the bezel, measuring $\frac{1}{16}$ th inch in diameter, found at Whitehouse, Inveresk, Midlothian.

(13) By Sir ALISTER P. GORDON-CUMMING, Bart., of Altyre.

Four old Spey Salmon Fly Hooks, one busked on a cast of horse hair.

(14) By W. DOUGLAS SIMPSON, D.Litt., F.S.A.Scot.

Fragments of six Neolithic Urns from a cairn at East Finnercy, Dunecht, Aberdeenshire. (See *Proceedings*, vol. lxiii. p. 62.)

The following purchases for the Museum were intimated:—

Nearly half of a Beaker of dirty brown ware, containing small fragments of crushed stone, including white quartz, measuring $6\frac{1}{2}$ inches in height, $5\frac{1}{2}$ inches in diameter at the bulge, and $3\frac{1}{2}$ inches across the base, the diameters of mouth and neck being unobtainable (fig. 3). The top of the rim is bevelled sharply downwards towards the interior. The wall shows three zones of ornamentation, one under the brim, one round the bulge, and one half-way between it and the base, all formed by impressions of a toothed stamp. The upper band consists of a transverse zig-zag line, a straight line, two narrow bands filled with a small lozenge pattern and oblique lines from left to right, another zig-zag and a narrow band of small lozenges. The other two zones have each a central band of small lozenge patterns with a band of oblique lines slanting from right to left above, and a similar band slanting in the opposite direction below. The label attached to it states "Two urns found in 1855, at Blackhills, Skene, Aberdeenshire, on the property of Mr Smith, in levelling a sand hillock. The more imperfect urn (this one) was found within and lying at one end of a rude stone coffin, and at the opposite end was a much-decayed human skull. The coffin was composed of loose unhewn stones, and measures 3 feet in length, 20 inches in height, and 24 inches in width; had three stones at its top, three at its sides, and none below. The inside of the coffin was singularly clean, containing only the urn and skull."

About two-thirds of a Beaker of dirty brown ware, containing some small crushed stones, measuring $6\frac{1}{2}$ inches in height, 5 inches across the mouth, $5\frac{1}{2}$ inches at the bulge, and $3\frac{1}{2}$ inches across the base (fig. 4). The lip is flat on the top. The wall bears three zones of ornamentation, on the rim and neck, round the bulge and near the base. The highest shows a narrow band filled with panels of horizontal and vertical zig-zags

alternating, below which are two lines of small oval impressions above short vertical lines, two other lines of similar impressions above short oblique lines slanting from left to right, and a band filled with panels of chevrons with the angle to the right and left, alternately; all the bands are separated from each other by a single transverse line. The central zone shows vertical zig-zags with two transverse rows of small oval impressions above and below, bordered by single transverse lines. Hardly any of



Fig. 3. Beaker from Skene, Aberdeenshire.



Fig. 4. Beaker from Skene, Aberdeenshire.

the lower band survives, but it seems to have consisted of a lozenge pattern. The label attached states: "Urn from a cist found in a sand-hill at Newhills, Parish of Skene."

Joiner's Rybat Plane, carved and dated 1737 on the top. On the front it bears the stamps V.K. and W.R. From Aberdeenshire.

Saw with wrought-iron frame and wooden handle, from Inverness-shire.

Saw for dishorning cattle, from Tillyfourie, Aberdeenshire.

Heathering Trowel, with rude bone handle, used for applying clay when thatching with heather, from Fyvie, Aberdeenshire.

Small Gridiron, with long narrow oval frame, measuring $17\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, from Aberdeenshire.

Folding Knife and Fork in horn handle.

Iron Brand, for branding criminals with the letter "S," from Aberdeen.

Instrument of Brass and Steel, having on one side:

COLINE ALLAN	} A scale for 21 feet. (For High Ways.)
Fecit et	
Invenit	

On the other side:

To The Rev ^d Doct ^r Grig. Sharpe,	} The Brass to be Wood 1770
•Master of the Temple, London	

Colin Allan was an engraver and silversmith in Old Aberdeen.

Back scratcher of Horn, from Seafield, Cullen, Banffshire.

Fragment of a check or tartan fabric, of yellow, blue, green, and red colours, and a molar tooth, found with the skeleton of a woman in Airds Moss, Ayrshire.

The following Donations to the Library were intimated, and thanks voted to the Donors:—

(1) By JOHN BRUCE, F.S.A.Scot.

An eye-witness's MS. account of the discovery in 1700 of the Baths of the Roman Fort at Old Kilpatrick.

(2) By Messrs WILFRED EDMUNDS, LTD., *The Derbyshire Times*, Chesterfield, Publishers.

Cave Hunting Holidays in Penkland. By G. H. Wilson. Chesterfield, n.d.

(3) By W. DOUGLAS SIMPSON, D.Litt., F.S.A.Scot., the Author.

Kildrummy Castle. Reprinted from *Transactions of the Banffshire Field Club*. December 1933.

(4) By Messrs ELLIOT STOCK, 16 and 17 Paternoster Row, London, E.C., the Publishers.

Records of the Carruthers Family. Compiled by A. Stanley Carruthers, F.S.A.Scot., and R. C. Reid. London, 1934.

- (5) By JAMES G. LOW, The Antiquary, The Tryste, Trinity, Brechin, the Author.

Memorials of the Church of St John The Evangelist, Montrose. Montrose, 1891.

- (6) By H. B. MACKINTOSH, M.B.E., F.S.A.Scot., the Author.

The Grant, Strathspey or First Highland Fencible Regiment, 1793-1799. Elgin, 1934.

- (7) By Rev. J. KING HEWISON, D.D., F.S.A.Scot.

Il Codice Vercellese. Rome, 1913.

The Runic Roods of Ruthwell and Bewcastle. By the donor. Reprinted from *The Dumfries and Galloway Standard*. June 1921.

Das Kreuz bei den Angelsachsen Gemeinverständliche Aufzeichnungen. By Karl Lentzner. Leipzig, 1890.

Account of the Remarkable Monument in the shape of a Cross, inscribed with Roman and Runic Letters, preserved in the garden of Ruthwell Manse, Dumfriesshire. By Rev. Henry Duncan, D.D.

Indices Lectionum et Publicarum et Privatarum quæ in Academia Marburgensi per Semestre Estivum.

Die Northumbriſchen Runenſteine von Wilhelm Vietor. Marburg in Hessen, 1895.

The Runic Roods of Ruthwell and Bewcastle, with a Short History of the Cross and Crucifix in Scotland. By the donor. Glasgow, 1914.

The Romance of Newcastle Cross. By the donor. Glasgow, 1923.

The Burlington Magazine, Odd Parts. London, 1912 and 1913.

- (8) By THOMAS MCGROETHER, F.S.A.Scot.

Catalogue of the Roman Inscribed and Sculptured Stones in the Carlisle Museum, Tullie House. By the late F. Haverfield, LL.D., D.Litt., etc. Second Edition. Kendal, 1922.

Catalogue of Romano-British Fibulae in the Museum, Tullie House, Carlisle. By Professor F. Haverfield. Kendal, 1919.

Catalogue of the Roman Pottery in the Museum, Tullie House, Carlisle. By Thomas May, F.S.A., and Linnæus E. Hope, F.L.S. Kendal, 1917.

Catalogue of Roman Inscribed and Sculptured Stones, Coins, Earthenware, etc., discovered in and near the Roman Fort at Maryport and preserved at Netherhall. By J. B. Bailey. Kendal, 1915.

County Borough of Reading. Short Guide to the Silchester Collection. By the late George E. Fox, M.A., F.S.A. Sixth Edition. Reading, 1920.

(9) By JAMES CURLE, LL.D., F.S.A.Scot., F.S.A.

Korrespondenzblatt der Westdeutschen Zeitschrift für Geschichte und Kunst. XXVI., 1882-1907.

Limesblatt. Mitteilungen der Streckenkommissare bei der Reichslimeskommission. 1892-1903. Trier, 1903.

Westdeutsche Zeitschrift für Geschichte und Kunst. I.-XXVI. 1882-1907. Trier.

Trésor de l'Eglise de Conques. By Alfred Darcel. Paris, 1861.

(10) By G. T. CLINDENING, Adelaide, the Author.

The House of Glendonwyn. Part IV. Parton.

(11) By F. T. MACLEON, F.S.A.Scot.

Aberdeen Burgess Ticket, with seal intact, in favour of James Fraser, son of James Fraser, merchant in Inverness, dated 1729.

Inverness Burgess Act, in favour of John Fraser, Inverness, dated 1702.

The following Purchase for the Library was intimated:—

Byzantine Architecture and Decoration. By J. Arnatt Hamilton, M.A., B.D., Ph.D. London, 1933.

The following Communications were read:—

I.

CLACHAN ARD FORT, BUTE. BY J. N. MARSHALL, M.D., F.S.A.Scot.

In the Island of Bute, at a point nearly due north of Scalpsie Bay and about a mile distant, on a rocky cliff, there is a nearly circular structure with all the appearance of a hill fort (fig. 1). At the beginning



Fig. 1. Clachan Ard Fort, from the east.

of September 1933 the wall was in a tumble-down condition; only here and there was there something which could be recognised as a wall-face.

A well-defined entrance could be made out at the eastern extremity, which is the part farthest from the sea and opposite which the ground falls gradually. Inside the entrance there was a distinct saucer-shaped and circular depression about 4 feet in diameter.

Nearly one-third of the area inside the wall consists of rocky outcrop, the rest is covered by smooth turf and bracken. From a point north-north-east to a point north-north-west, the wall is absent, and its place is taken by the edge of the cliff, which descends precipitously to a more or less flat piece of rocky and grassy surface, extending about 50 yards to the seashore. Measurement across the area from ends of wall 96 feet; greatest diameter from cliff to wall 62 feet (fig. 2).

The height of the cliff is 55 to 60 feet above sea-level. The rock of which the cliff is composed is schistose grit.

Examination and some excavation was undertaken by Lord Bute, on 8th September, when five of the estate workmen were employed on clearing away a number of loose stones. A fairly well-defined wall could be made out from 1 to 2 feet high, consisting for the most part



Fig. 2. Clachan Ard Fort: Plan.

of flat and rounded stones, with here and there a larger block (fig. 3). At intervals there were gaps in the wall which were evidently accidental. At the north end of the precipice, the wall tapered away to a point; at the south end to a blunt extremity. An inside wall-face was also made out after clearing away many stones, and the width of the wall was found to be on an average 10 feet.

A very large single stone 8 feet 8 inches long and 2 feet broad formed the greater part of the northern side of the entrance, the entrance being 10 feet long. The south side was composed of large flat stones. Between the outside and inside wall-faces the interval was filled in with small loose stones.

During the process of defining the inner wall-face, at a point near to the entrance, a saddle quern was found at a depth of 1 foot un-



Fig. 3. Clachan Ard Fort: Outer Face of Wall at south-east.

accompanied by any other sign of human occupation. At another point of the inner wall-face (marked on plan) a portion of kitchen-midden was found, consisting of split bones and shells and a single smoothing stone. Here there was also some carbonaceous material, but no recognisable hearth-stone. At another point in the thickness of the wall where there was a depression, at 6 inches below the surface, there were a few large bones (ox)? not split. At another point of the area near the north-west corner there was a largish flat stone broken in two. Under this was a hollow scooped out in the rock, 12 inches deep and 19 inches in diameter, similar in shape and size to a harley stone mortar.

A trench was run through the hollow inside the entrance to the fort, but nothing but loose stones and finally solid rock was found. Another trench was run from the precipice eastward, but with similar negative results.

Near the wall a stone $2\frac{1}{2}$ feet long and $\frac{1}{2}$ foot broad was found smoothed and slightly hollowed on the surface, as if a natural stone had been used as a grinding stone.

Almost exactly in the centre of the enclosure a large flat stone was found just under the turf. On being uncovered, four saucer-shaped excavations were seen on the surface, each measured 3 inches in diameter and altogether they formed a parallelogram, with the long axis lying almost due north and south.

This fort, called Clachan Ard, is marked in the Ordnance Survey Map. It looks down on the Sound between Bute and Inch Murnock and has a little bay to the north of it. It is significant that there is what seems

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to be a standing stone 5 feet in height placed above the head of the bay and in a direction north-east from the fort. This stone is not noted in the Ordnance Survey Map.

II.

ON A GROUP OF SHORT CISTS AT LITTLE KILMORY, BUTE.

BY J. N. MARSHALL, M.D., AND PROFESSOR T. H. BRYCE, M.D., F.R.S.

The group of Cists described in the following paper was laid bare by the plough in March 1933. The piece of level ground on which they are placed stands 40 feet above the sea, and some 200 yards from the shore.



Fig. 1. Plan of Short Cists at Little Kilmory, Bute.

When the cists were first discovered, Mr Charles Duncan, the farmer at Little Kilmory, lifted the capstones, but left the contents as he found them, except that he removed, for safe preservation, the fine food-vessel urn contained in one of the cists, to the Bute Museum. The capstones were carefully replaced and in their exact original position, and the cists were left undisturbed by the directions of the Marquis of Bute until 19th June 1933, when they were re-opened by Dr Marshall and Professor Bryce in the presence of Lord and Lady Bute.

The three cists were placed in a line roughly north and south (fig. 1), and will be named North, South, and Middle cists respectively.

1. *North Cist*.—The capstone of this cist measured 5 feet 1 inch by 3 feet 10 inches. When removed, the cist it covered was seen to have the ordinary characters of a Bronze Age cist. Its inside measurements were 3 feet $\frac{1}{2}$ inch by 1 foot 6 inches, with a depth of 22 inches. It was oriented with its long axis 25 degrees E. of N. (mag.). The constituent



Fig. 2. North Cist at Little Kilnory, Bute.

flags of mica-schist measured on the average 3 inches thick. The side stones were placed outside the end stones, but did not project beyond them.

The bottom of the cist, which was not paved, was covered with gravel with very little admixture of pure earth, and on the gravelly bed were exposed to view a number of very much broken and macerated long bones (fig. 2). Two portions of femora and two portions of tibiae were recognised. As no trace was left of the ends of the bones, no opinion could be formed, from the state of ossification of the bones, as to the age of the individual. The fragmentary shafts were so delicate and

short that it was concluded that the individual must have been of tender years. No trace of skull bones or vertebrae was to be seen. The larger fragments being removed, the gravelly soil was carefully riddled and as many as twenty-one teeth were collected. Some of these were crowns of deciduous teeth, others were permanent teeth, and the conclusion arrived at was that the individual buried in the cist was a child of eleven to twelve years of age. The crucial point in the diagnosis was the crown of a deciduous canine which had been just ready for



Fig. 3. Food-vessel from the North Cist at Little Kilmory, Bute.

shedding. Assuming that the bones had not been moved it was concluded from the position of the thigh bones that the head of the doubled-up body must have lain at the north end of the cist.

The only relic detected by the riddle was a minute rod-shaped fragment of bright green colour which may have been the fragment of a bronze pin. It was from this cist that the food-vessel mentioned above was recovered (fig. 3). It was placed at the south-east corner of the interior. It was recovered entire, save for a small part of the base. The urn stands 6.4 inches high, with a diameter at the mouth of 6.3 inches. It is provided with a shoulder marked by a groove which is bridged by small imperforate lugs. There were originally three of these lugs placed at regular distances. Two only are intact; one has been broken off. The borders of the groove are ornamented by linear punctations, executed free hand. This ornament extends round both

lips of the groove, but while it is carried all the way round the lower lip, it extends only half-way round the upper one. The mouth is bordered by a broad inward sloping rim .75 inch broad. This rim is rather roughly and irregularly ornamented with incised lines, some running for a longer and some for a shorter distance, the shortest ones being mere dabs. The upper part of the vessel between the slightly everted lip and the shoulder groove measures 1.75 inch; it is ornamented all round by horizontal lines mainly parallel, some horizontally, some more obliquely disposed. Some of these lines are 2 to 3 inches long, others are mere parallel strokes of the tool. The lower part of the vessel is ornamented in the same technique, but the incised lines are more irregularly disposed and sketchily executed. The base is circular and measures 3.2 inches in diameter. The actual surface of the base has been broken away so that the margin on one side is imperfect and the urn resting on its base stands inclined to that side. The under side of the base shows no decoration. The lugs show close horizontal parallel scratched lines on their outer faces.

2. *Middle Cist*.—The middle cist was placed 11 feet south of the one just described. The capstone measured $33\frac{1}{2}$ by $41\frac{1}{2}$ inches. Though of smaller dimensions, it was a thicker slab than the capstones of the other two cists. The covering stone being removed, it was seen that the cist had the same characters as the one already described. It was neatly constructed of thin slabs, the end stones, as before, being received between the side stones without any overlap. While the side stones were 3 inches thick, the southern end one was only 2 inches, and the northern not more than 1 inch thick. The internal measurements were $30\frac{1}{2}$ inches by 18, and the long axis lay 30 degrees E. of N.

The cist was unpaved and had the same gravelly floor as the last, and on it lay exposed some fragments of long bones and a small part of the skull. The largest fragments were portions of the femoral shafts. These were small and delicate and the extremities were absent. The skull was represented by some minute fragments, the largest portion representing part of the parietal bone. With this could be articulated the left temporal bone which was complete but for the zygomatic process. This fragment of the temporal bone showed no mastoid process, but a few air cells were laid bare at the point of its attachment. A fragment of the alveolar portion of the mandible was also recovered, and eight teeth, some deciduous, some permanent. The characters of these dental fragments indicate that the individual was a child of twelve to thirteen years of age. This opinion is based upon the facts that there was a well-developed permanent canine, of which the apex had not quite closed, and the crown of a twelve-year-old molar still rootless.

The only relic yielded by the riddle was a small bit of local lignite.

3. *South Cist*.—This third cist lay 9 feet south of the middle cist, and was the smallest of the group. The capstone was larger than that of the middle cist, being 44 inches by 37 inches, but it was a thinner slab. The cist had the same general form as the other two, being formed, like them, of flags of mica-schist. The construction, however, was less regular. Thus the side stones, roughly 3 inches thick, measured—the west slab $26\frac{1}{2}$ inches long, the east $29\frac{1}{2}$ inches long. The north slab measured 16 inches and the south end stone 14 inches. The cavity was therefore slightly irregular. Its main long axis measured 27 inches, and its transverse axis 15 inches. Its long axis lay 40 degrees E. of N. The floor of the cist was formed of the same gravelly material as the other two, and as in them fragments of the skeleton of a young person lay freely exposed. The long bones included fragments of a femur, a tibia, and a fibula. The shafts were very short and slender and the epiphyses were absent. A minute fragment of the left ramus of the mandible was recovered, with coronoid and condylar processes complete. The bone was delicate and the articular process on the head was small and narrow. A few deciduous teeth were recovered, with two six-year-old molars. As the crowns of these last showed no trace of wear they could only have been recently erupted at the time of the death of the child. In addition there was a typical complete deciduous molar and two rootless crowns of permanent molars. The evidence yielded by both long bones and teeth indicates that this must have been the grave of a child of about six years of age.

This group of short cists is of some interest, apart from the recovery of the fine food vessel. Unfortunately no other relics were forthcoming, save the minute fragment of bronze, which, however, is sufficient to give the archaeological horizon of the find.

The relation of the cists to one another clearly indicates some pre-arranged plan. There is no indication, however, whether they were placed simultaneously or in succession. The grouping of three cists on a definite plan, all containing the remains of children, is an unusual feature of this find; indeed we are not aware that it has been previously recorded. In the present instance the cists were all of relatively small dimensions, the largest being that which held the food vessel urn. The long bones were so broken and macerated that they only afforded ground for a guess as to the age of the persons buried. The teeth, however, gave decisive evidence, and we are indebted to Mr Purvis Thomson, Dentist, Rothesay, for help in working out the problem of the ages of the children. It will be noticed that the youngest child was interred in the smallest cist.

This group of burials, inter-related as they are by some common purpose or sentiment, shows that the bodies of their dead children were buried with reverent care by the people of the Bronze Age. This indicates that family bonds were well developed, and that the people had attained a relatively high level of social culture.

III.

SOME PREHISTORIC RELICS FROM LEWIS.

By W. J. GIBSON, C.B.E., F.S.A.Scot.

In the School Museum of the Nicolson Institute, Stornoway, are preserved certain prehistoric relics found in Lewis, which it seems desirable to have recorded. Through the kindness of Mr John Macræ, Rector of the Nicolson Institute, these are now exhibited.

1. Carved stone ball of six knobs found on a craft at Laxdale, Parish of Stornoway. This extends the record of the distribution of these objects to the Outer Isles. Diameter = 2.9 inches, weight = 18 oz.; material, hornblende gneiss of a kind occurring both locally and on the mainland.

2. Tanged and barbed arrow-head (fig. 1, No. 1) found at Carisbader, Parish of Uig. Length = 1.2 inch, breadth = 0.7 inch, thickness = 0.3 inch; material, translucent quartz, such as occurs locally.

3. Bronze pin with ornamental head (fig. 1, No. 2) from Reef Sands, Parish of Uig. Length over all = 3.1 inches, tapering in thickness from a little over 0.1 inch at middle to the point and at the neck to 0.1 inch. Head circular, flattened; diameter = 0.3 inch, thickness = 0.15 inch; decorated on each flat face with two small punch marks, diverging at angle of 45°; neck ornamented with beaded collar. Several similar pins are in the National Museum collection.

4. Small oblong plaque of jet (fig. 1, No. 3) from Reef Sands, Parish of Uig. This was found by Mr Malcolm Buchman in April 1924 among human bones which were temporarily exposed in the Reef Sands on right of road and about 7 feet below top of bank. He reported that among the bones were two skulls, and on top of them in the sand three slabs of stone. He covered up the bones with sand. It was rumoured in the district that a "craggan" had formerly been found near the spot. The plaque is oblong, with ends slightly incurved; length = 1.7 inch, breadth = 1.05 inch, thickness = 0.3 inch, thinning to 0.2 inch at edges. One hole

for a suspending string, about $\frac{1}{12}$ inch in diameter, is bored longitudinally, close to, and parallel with, one of the long sides. One corner of the oblong had been broken off, and (seemingly with the intention of



Fig. 1. Prehistoric Relics from Lewis. ({}.)

mending it) two small holes, about $\frac{1}{8}$ inch in diameter, have been drilled through the plate at right angles to the surface, near to, and parallel with, the broken edge. As to the purpose of the ornament, the shape of the plaque and the nature of the perforation for suspension

show that it is not a spacer of a necklace but may possibly have been worn as a single pendant. I have not been able to find a parallel.

5. Portion of penannular brooch in brass or bronze (fig. 1, No. 4) found in 1919 by Mr C. B. Macleod about 10 feet below present surface, in a kitchen-midden on beach near Aignish Church, Eye Peninsula. Outer diameter of penannular ring = 1.4 inch; ring 0.15 inch broad and 0.1 inch thick, with expanded ends 0.5 inch by 0.4 inch, each having lozenge-shaped sunk panel touched on outside by four small spirals from the moulding, each panel filled with interlaced ornament. The casting has been done in an open mould, the workmanship is of moderate quality, and the design debased through copying. The kitchen-midden is exposed on the beach, and has been partly removed by the sea. It occupies a restricted area, and has blown sand above and below. The thickness of the occupational deposit is about 3 feet, and the succession from above downwards is as follows: About 6 inches mainly of whelk-shells; layer of dark earth, with fragments of coarse pottery and fish-bones; layer with limpet and mussel-shells and bones; layer in which the shells are less numerous but containing some large fish-bones. One small stone pestle or pounder was found.

6. Pin of penannular brooch of bronze (fig. 1, No. 5) found at Valtos, Parish of Uig, near the spot from which came the Viking Relics exhibited to the Society in Session 1915-16 and described in the *Proceedings* for that year. There is little doubt that it belonged to that set of ornaments. Total length of pin including loop = 3.9 inches. Stem, 0.2 inch thick, is flattened out above to a breadth of 0.5 inch, with a thickness of 0.05 inch, and bent backward to form loop, which has an interior diameter of 0.5 inch clear. This broad portion tapers, and thickens, gradually into the stem. Back part of loop narrows to 0.15 inch where bent back against stem. Broad part of front of loop is ornamented with an elongated triangular panel sunk within marginal mouldings and containing an interlaced pattern, debased in the casting by frequent copying. Pointed end of stem for 1.2 inch of its length flattened—front, back, and sides. The pin is of an unusually stout pattern. The ring of the brooch to which it belonged may have been of 2 inches to 2½ inches in diameter.

7. Axe-hammer of "cushion" type found in 1904 by Mr George Macleod at Knock, on top of a gravel bed under 5 feet of peat. The implement is of adze form, with the haft-hole at right angles to the blade. Total length = 5.15 inches, breadth at middle = 1.65 inch, tapering slightly towards the sub-rounded ends, one of which is slightly narrower (1.4 inch at ½ inch from end) than the other (1.55 inch at same distance). The haft-hole, which is nearer the narrower end by ⅓ inch, has parallel sides and is 0.7 inch in diameter; the drilling is technically perfect.

Thickness in the middle = 1.25 inch, tapering gradually to the rounded sides. The section at the middle is a roundish oval; towards the ends it flattens. The convexity is less on one face than the other, giving a ventral and a dorsal aspect. The entire surface is finely polished. The craftsmanship and finish are of the highest quality. The beauty of the stone selected, and the ingenuity shown in cutting it in the direction that gives the finest effect to the banded markings, are noteworthy.

Two points of general interest may be commented on: (1) Though the number of specimens on record in the British Isles of this "cushion" form is small (I have been able to trace only about two dozen) the type is very definite. Its features are the pillow shape, a difference of convexity in the two faces, the parallel-sided haft-hole at right angles to the blade and placed somewhat nearer the narrower end, the bladed ends with rounded instead of cutting edges, the over-all polish, the selection of stone of a decorative quality (usually greenish, but in several cases black-and-white banded), and the fine craftsmanship and beautiful finish. It was long ago pointed out that a number of the axe-hammers of the Bronze Age show no indications of use either as tools or as weapons, and were probably intended for some ceremonial or ritual purpose. This has been recently emphasised by several archaeologists.¹ The present Lewis specimen is further evidence for this view: it has never been used either as axe or as hammer; indeed, the shaping of the ends would make it useless as either. Where did this rare "cushion" type originate? Of 14 Scottish specimens, 2 were found in Shetland, 4 in Orkney, 2 in Lewis; that is, 8 in all from the northern islands. The remaining 6 range from Caithness by the east of Scotland to the Lothians. Half a dozen English specimens come from the Thames or its neighbourhood. It is not safe to generalise from such a small number of specimens, but, for what they are worth, the figures seem to suggest that the type has spread from the north southwards. If this be so, we have here another small indication of the originality of the northern islesmen in the prehistoric periods, a feature which has impressed various investigators.² Evidence of this individuality is apparent in a wide range of northern antiquities. It gave a characteristic touch even to types of implements and pottery, and to customs, e.g. of burial, that reached them from outside. Instances that they had methods of their

¹ E.g. Dr J. Graham Callander, "A Stone Axe-hammer from Perthshire," *Proceedings*, vol. ix. p. 258; Ludovic M'L. Mann, "Axe-hammer Heads," *Proceedings*, vol. lvii. p. 102; Reginald A. Smith, "Specimens from the Layton Collection in Brentford Public Library," *Archæologia*, vol. lxxix., in which the "cushion" type and its range are discussed; and "The Perforated Axe-hammers of Britain," *Archæologia*, vol. lxxv.

² E.g. Dr J. Graham Callander, "Certain Prehistoric Relics from Orkney," *Proceedings*, vol. lxx. p. 78, and *The Bronze Age Pottery of Orkney and Shetland*, vol. lxvii. p. 352; J. M. Corrie, "Certain Prehistoric Relics from Shetland," *Proceedings*, vol. lxxi. p. 75.

own of dealing with their material readily suggest themselves—the uniqueness of the chambered mounds of Midhowe and Maeshowe, some of the special features at Jarlshof and Skara, the ground-plan of the Standing Stones of Callanish, the island brochs and their subsidiary structures, the neolithic pottery of Unstan, and the Northmaven knives to be referred to later. Other points suggested by this form of axe can only be left as questions. Were these implements the ceremonial mace-heads of secular authority? Or were they the sacred symbols of some religious cult? In either case what determined the form? Is its prototype a workman's adze? Or is it derived from the peasant's modest hoe, suitable symbol to emerge with honour among a people whose interests were presumably agricultural?

(2) The second point of general interest has been suggested by the material of which this specimen is made. Dr T. M. Finlay identifies this as a type of rhyolite, passing into quartz porphyry, which occurs in Northmaven, Shetland, and, as far as the British Isles are concerned, is peculiar to that district. The uniqueness of the material suggests an inquiry as to the nature of the implements made from it and the extent to which they may have drifted southwards. The so-called "flensing knives" of Shetland are found, with very few exceptions, to be of this rock. Dr Finlay points out that the banded nature of the material lent itself readily to the making of thin plates susceptible of a high polish and a sharp edge. Other implements fashioned from the Northmaven rock are adze-shaped, with a spreading blade. Of the same material also are two of the perforated "cushion" axes under discussion, one of these the Lewis specimen, the other found as far afield as Fife. When one remembers, too, the movement of the island steatite in the form of cups and urns, this southward drift of objects from Shetland seems worthy of further investigation.

IV.

THE MONYMUSK RELIQUARY OR BRECBENNOCH OF ST COLUMBA.

By FRANCIS C. EELES, F.S.A.Scot.

The recent acquisition by the Nation of the famous Monymusk Reliquary makes it desirable to remind the public of to-day about the history and character of this beautiful work of the art of the Celtic period. That period was one of very high artistic development in things of small size. It produced no great buildings; its churches, though numerous, were remarkably small, but in metal-work, in the writing and illumination of manuscripts, and also in certain forms of sculpture we may claim that it has never been surpassed. If the Monymusk Reliquary has not the superlative quality of the Hunterston brooch or the Ardagh chalice, it belongs to the same category of art, and the fact that we in Scotland possess few such treasures compared with those in Ireland, gives it an added importance, and makes the securing of it for the Nation an event of outstanding significance.

It is not possible to add anything very material to what the late Dr Joseph Anderson said about it in *Scotland in Early Christian Times*, as far back as 1881 (pp. 241 *sq.*). Subsequently Dr Anderson dealt more fully with this and other similar objects in a paper entitled "The Architecturally Shaped Shrines and other Reliquaries of the Early Celtic Church in Scotland and Ireland." This was printed in our *Proceedings*, vol. xlv., 1909-10. In reviewing the available material on the subject one is amazed at the brilliance and ability of Dr Anderson. With the passage of time it becomes increasingly evident how very great an antiquary he was, and how acute and accurate were his judgments. It is true that an occasion has arisen, an occasion upon which Dr Anderson would have rejoiced more than anyone, when it is necessary to go over the facts once again, but I cannot do so without feeling that it is almost an impertinence to attempt to cover the same ground, for there is little, if anything, that I can add.

Four classes of objects of personal use seem to have been specially cherished in the Celtic Church on account of association with the saints. These are their books, bells, crosiers or staves, and portable reliquaries to be hung round the neck. We are familiar with objects of each kind. There is the Cathach of St Columba, a psalter in a silver shrine, now at Dublin; there are the bells of Saints Patrick, Fillan, Finan, and

others; the crosiers of Saints Fillan and Moluag. Of the reliquaries only six exist, of which the Monymusk Reliquary is one. Dr Anderson considered it the finest of all as a work of art.

In the case of books, bells, and crosiers, we have objects actually used by the saints, afterwards enshrined in elaborate metal cases for their better preservation. In that of the reliquaries we have only the shrines without the contents and we do not know what these were. Is it possible to make any suggestion as to this? At first sight the shape of the reliquary, so like that of the larger shrines in the great churches of non-Celtic lands, from which has been traced the shape of the hog-backed stones, suggests that it contained some portion of the body of the saint. But this is by no means certain. It is the shrine itself, the Breebennoch, and not its contents, which is specified in the documents concerned with its use and custody. Its importance does not seem to have been other than that of the bell or the book or the crosier, objects used in the service of the church by the saint. If we follow this line of inquiry, we may be led to ask for what liturgical purpose these shrines could have been used. The answer may be that they were used for carrying the reserved Eucharist and the holy oils for the use of the sick. This would explain their oblong form. It must be remembered that the idea that the Eucharist must not be reserved in the same aumbry as the holy oils belongs to the latter part of the mediæval period, if not to the time of the counter-reformation abroad. If there be any truth in this theory it would account for the suspensory form of these vessels and also for the close parallel between their treatment and that of the other personal relics of the Celtic saints.

The other Celtic shrines of reliquary type which have survived are the following:—

(1) The Breac Mogne or Shrine of St Moedoc or Aedan of Ferns, now in the National Museum, Dublin. Probably eleventh century, and has not hipped ends like the rest.

(2) A shrine found in the Shannon, now in the National Museum here.

(3) A shrine brought up on a fishing line from the bottom of Lough Erne in Ireland, now in the National Museum, Dublin.

(4) A shrine taken by Vikings to Norway, now in Copenhagen Museum.

(5) Another found in a Viking grave mound at Mellus in the Namdalen Valley, Norway, now in Trondhjem Museum. Believed to be of the seventh century.

The Monymusk Reliquary, for reasons to be explained later, was identified by Dr Anderson as the Breebennoch of St Columba. It consists of a rectangular box and a hinged lid in the form of a hipped roof.



THE MONYMUSK RELIQUARY (Full Size).

both of wood and roughly hollowed out of the solid. The front of the casket and the lid are covered with thin plates of silver, and the back, bottom, and ends with similar plates of bronze, the junctions being clasped by semi-tubular bindings of the latter metal. The ridge on the top is surmounted by a rounded bar with flat projecting terminals, rounded above and flat on the under side. At one end of the casket is a hinged bronze arm to receive the end of the strap by which the reliquary could be suspended round the neck of the individual who carried it on his breast. This arm is hinged on a semicircular plate attached to the side of the box, and at the top is a small free ring. The corresponding attachment on the opposite end is lost, but the rivet holes where it was fixed remain. The reliquary measures $4\frac{3}{4}$ inches in length and 2 inches in breadth at the base and $3\frac{1}{2}$ inches in total height.

The silver plates on the front of the box and on the lid are decorated by interlaced lacertine animals, lightly incised, the background being stippled with small punctulations.

In the medial line of the plate on the lid are three applied plaques. The central one is circular, and it is enclosed by a moulding of semi-circular section, decorated with three equally spaced segmental settings of red enamel, and on either side is one of rectangular shape, with similar mouldings on the border, having inlays of red enamel at the corners. The circular panel has a rosette in the centre surrounded by a running interlaced pattern cut in relief, and the two at the sides have four interlaced designs between the margin and a small rectangular protuberance in the centre. On the front of the box there had been originally three plaques of similar shape and design to those above, but the central one has been rectangular and those at the sides circular. Only the circular one on the left side survives. The back and ends are without ornamentation. All the plaques and the top bar have been gilded.

In the centre of the bar on the ridge is a rectangular slightly projecting panel of interlaced work, the terminals being similarly ornamented back and front, with a circular setting of dark blue glass in the centre: the glass setting in the left projection is the only one which remains. The top of the panel in the centre has been filled with red enamel. The edges of the projections bear a herring-bone milled design.

The hinge plate is enamelled red with a semicircular star in the centre enamelled yellow. The loose arm is also enamelled red, with S-shaped scrolls on the sides and bottom appearing through the colour, and with a triquetra above. At the top is a small round socket which, presumably, had contained a setting of blue glass.

It may be noted that in Dr Anderson's illustrations and descriptions of the shrine the two missing ornamental plaques in front are

represented as existing; this was in 1880. Apparently this was a restoration for the purpose of the illustration, as Stuart's picture in his *Sculptured Stones of Scotland*, vol. ii. plate xi., shows that they were missing in 1867.

There seems no reason to dispute the identity of this reliquary with the object described in documents as the Brechennoch of St Columba. In a charter of William the Lion, before 1211, he grants to the monks of Arbroath this Brechennoch and

"the lands of Forglen given to God and to St Columba and to the Brechennoch, they making therefor the service in the army with the Brechennoch which is due to me from the said lands."

Now the church of Forglen in Banffshire was dedicated in honour of St Adamnan, St Columba's successor and biographer, and Dr Anderson suggested that the shrine had very likely been attached to Forglen before it and its lands were granted to Arbroath.

In 1314, after having been at the battle of Bannockburn, Bernard, Abbot of Arbroath, with consent of his chapter, no doubt to avoid further military service, granted the Brechennoch and its lands to Malcolm of Monymusk, on condition that he should perform in their name the military service connected with it.

From that time to the present the shrine has been at Monymusk, in possession of the family owning the castle there. It is mentioned repeatedly in documents down to 1512. A fire in Monymusk Priory in 1554 caused it to be removed to the tower of the castle, now included in the present house, where it remained until acquired for the Museum.

It has been suggested that the name Brechennoch meant "the blessed Brec" or "the speckled blessed one, breac bennnighte." Professor W. J. Watson, F.S.A.Scot., derives the name from "breac-bennach," the variegated or speckled peaked one;¹ the older spelling would be, in Middle Irish, "breacc-bennach," and Brec is the name by which the similar shrine of St Moedor or Aedan of Ferns in Ireland is described.

It is manifestly impossible to question the identification of the reliquary till recently at Monymusk Castle with the Brechennoch of these mediæval documents.

It should hardly be necessary to add that, as pointed out by Dr W. Douglas Simpson in *Proceedings*, vol. lix., 1924-5, p. 38, the shrine "has no ascertained connection either with the Culdee settlement or with the Priory" at Monymusk.

The *cultus* or veneration of the relics of saints is ancient and widespread in the Christian Church. Attention has often been drawn to the strange practices—as they seem to us—which went on in this

¹ *Celtic Place-names of Scotland*, p. 281.

connection in the Middle Ages, the theft of relics by churchmen, the traffic in spurious ones, the financial scandals. But as early as the fourth century there is evidence of the belief in the association of certain phenomena with the relics of saints. However little understood or greatly abused, there seems reason to believe that such phenomena had a sufficiently objective existence to account for some, at any rate, of the uses to which relics soon came to be put. Any further consideration of this side of the subject, however desirable it may be, or whatever light future investigation may shed upon it, is no concern of ours in this connection. But it seems desirable to go so far as to suggest that the uses to which relics were put of old were dictated by phenomena which some to-day would call "psychic" and which, if better understood, might help to explain why in actual practice certain lines were followed which, taken at their face-value, seem somewhat arbitrary.

Relics of saints included not merely bones or fragments of their bodies, but objects that had been in specially close contact with them. Such objects seem to have been thought to constitute in some mysterious way links by which it was possible to make contact with the spirit of the saint and so secure his presence and help.

It was believed that such relics helped to keep away evil influences or evil spirits, and that they had healing properties. Hence we find them carried by persons and used for protection. Thus came the special regard attached to such small shrines as that we are considering now and the particular use to which we believe they were put, namely, carrying on the field of battle.

This is specified in the documents, and the name of Cathach given to the psalter of St Columba means that which is connected with a battle.

This psalter was carried in battle in Ireland as late as 1497 on the breast of its keeper. The crosier of St Columba was carried in like manner and was called the Cath Bhuaith. The use of the word *varillum* in Latin, as referring to these relics, when carried in battle, has caused some confusion, as it has been misread as referring to a banner in the ordinary sense instead of to these relics when used in this particular way.

From Rome there spread, it would seem, the custom of consecrating a church by means of the burial of some martyr within it, beneath its altar. This derives from the custom of meeting for worship at the martyr's grave and celebrating the Eucharist over his tomb. In A.D. 787, the Second Council of Nicæa forbade the consecration of an altar without the enclosing within it of the relics of a saint. But the Gallican or non-Roman method of consecrating a church or altar was different, and there is reason to think that in the Celtic Church altars were

consecrated without relics. Certainly in the later Middle Ages, when the services for consecrating churches and altars consisted of a conflation of both Roman and Gallican elements, there is some evidence that in this country the use of relics was at times dispensed with. So far as we can tell the chief use of relics in the Celtic Church was that of the permanent preservation and endowment of these objects of personal association with the great saints, which were safeguarded by being committed, not so much to any one church as to the custody of a hereditary keeper or Dewar. This is the most striking use with which we are brought in contact in Celtic Scotland and Ireland, but it obviously does not exclude other uses of relics such as are to be found elsewhere.

The reader who desires more information about the Breckenmoche and similar personal relics of Celtic saints should read the writings of the late Dr Joseph Anderson, to which reference has already been made.

The reliquary was bought by subscriptions received from friends of the Museum in Scotland, and by a contribution of more than half of the purchase price given by the National Art Collections Fund. It may now be rightly regarded as one of the greatest treasures of the Scottish nation.

V.

A GLASS JUG OF ROMAN DATE FROM TURRIFF, ABERDEENSHIRE.

BY W. A. THORPE, VICTORIA AND ALBERT MUSEUM.

The National Museum of Antiquities has lately acquired a glass jug (No. 1933-2184) of Roman date and of considerable interest (fig. 1). This vessel was found in 1857 near Turriff, Aberdeenshire, in circumstances which have already been described in these *Proceedings*,¹ but without any concomitants which might afford the means of dating it precisely; I am informed that the occupied Roman site nearest to the place of discovery was the Roman camp at Glenmailen. The jug stands $8\frac{1}{8}$ inches high and is of clear light-green metal. The body is short and conical (height $4\frac{1}{8}$ inches, base diameter $5\frac{1}{2}$ inches), and is decorated with spiral wrything executed during inflation with the aid of a mould, but not actually determined in the mould. The neck is tall, narrow, and cylindrical, with the orifice slightly everted to facilitate pouring, and the base slightly contracted by a nip of the tool. The handle was bent sharp over a tool during fabrication and makes an acute angle. It is flat and straplike in form, with a single line of raised "beading"² running down the outer side from sticking-part to sticking-part, and terminates in three times



Fig. 1. Glass Jug of Roman date found near Turriff, Aberdeenshire.

¹ *Proc. Soc. Ant. Scot.*, vol. lxi., 1880, p. 147.

² Handles with a line of beading are moderately frequent in Britain.

which grip the body. The middle line is drawn down to within about 2 inches of the base and is finished with a pincered fringe of six teeth.

In Britain the earliest stage of jug form in glass is represented by a coloured-blue jug in the Taylor collection (No. 464 PC) found and preserved at Colchester, a damaged piece but a lovely bit of blowing. Jugs of this kind commonly have a thin-blown body of baluster form—sometimes a very squat baluster—and a neck relatively wider than in the Turriff jug and its cousins. Jugs of the Taylor type are usually but not always undecorated, and they belong mainly to the middle of the first century A.D.—their date is well established. Two features in them require notice. The blowing is as nice a job as one could wish to see, but the shape is not a glass shape. If you are throwing a pot your tendency in drawing up the vessel from the wheel is to get the maximum volume in the upper “hemisphere.” If you are blowing a glass your tendency is the opposite, to concentrate the maximum volume in the lower hemisphere. It is not always so, but such is the bias of the process. In the glasshouses which produced Taylor jugs, design was still conditioned by a potting conception of vessel form. Production policy was fixed by the routine Hellenism which sold well in the Italian market and in the northern provinces which had gone Roman. Inflation is so good that the jugs may be ascribed to Syrian firms who had established themselves in Italy¹ and who showed a Semitic genius for anticipating demand. Not so the “Turriff” jugs. Here the inflation is less virtuous, but the vessel is a more natural glass shape. These things point to manufacturers who could give their gaffers a free hand, to a market where the snob appeal of Roman Italy was no longer necessary to sell the goods, to a date when the rage for going Roman was passing its zenith.

So much being evident in the jug itself, we may turn to its cousins. The family share the squat conical body, the tall neck, and the tall handle bent over at an acute angle. They fall into three main species: (1) with the body plain; (2) with the body ribbed vertically; (3) with the body writhen spirally (as Turriff). The metal varies from a dirty sea-green to the rich golden-brown found in a related family of small globular handleless jars, often used as cinerary urns, but perhaps made for domestic purposes. The pincered fringe at the sticking-part is usual, but not universal; the longer and more elaborate the fringe is, the later the jug seems to be.

The inceptional type seems certainly to be represented by a jug at

¹ The Campanian coast, Aquileia and Rome being the chief areas. The industry was also early in the Lower Rhone area.

Cologne (W.-R. Mus. No. 25474), illustrated in *Denkmäler des röm. Köln*, vol. i., 1928, pl. 14, and dated by Fremersdorf about A.D. 100. Here size and utility suggest the same trade model as the Taylor jug, but the principle of design is completely changed. The Turriff form begins to appear, but at Cologne (1) the body is plain; (2) the top of the handle is still a sweeping curve,¹ and (3) there are as yet no lines and no pincer-fringe at all. Turriff is later than this. An example with plain body, but otherwise near to Turriff, and on style certainly later than Cologne, was found in the Champ Bostonbe, Walsbets (near Landen), with a coin of Faustina (d. 141) in the same grave (Belgium, *Bull. Comm. Roy. Art et Arch.*, iii., 1864, p. 317, pl. iii., fig. 22). This suggests middle or latter part of the second century. An example, with vertical ribs but slightly different in detail of shape, was found at Cologne, with coinage of Antoninus Pius (138-161) (*Bonner Jahrb.*, cxv., pl. xxiii., No. 31b, and p. 403). A coin of Vespasian accompanied the examples of the vertical-rib variety found at Avennes, near Waremmé, Prov. of Liège (*Bull. Instit. Arch. liégeois*, xii., 1874, p. 218, and pl. vii., Nos. 6-7).

Two examples of the spirally writhen group, which conform most closely to Turriff in form and in decoration, were found in separate graves of the Cimetière des Ilints, at Flavion, near Dinant. One of them (grave 22) was of the golden-brown metal and lacked evidence of a date *a quo*. The other (grave 200) was found with coins of Domitian (81-96) and Trajan (98-117) in the same grave. The cemetery was mainly of the second century, the dominant coinage being that of Domitian, Trajan, Hadrian (117-138), Antoninus Pius (138-161), and Marcus Aurelius (161-180) (*Namur Soc. Arch. Ann.*, vii., 1861, pl. vii., No. 1, and grave groups, pp. 7 and 14).

Examples with two handles also occur, but not often. Morin-Jean figures such a jug at Mainz (*La verrerie en Gaule*, 1913, fig. 141) and, rightly I think, calls it late (i.e. third century). Turriff is obviously earlier than this. The well-known example from Bayford, Kent, with two tall handles, also I think later than Turriff, is figured by Dillon, *Glass*, 1907, pl. ix. (2), and is in the British Museum. Kisn, *Das Glas im Altertum*, 1908, fig. 322b, illustrates a two-handled example with vertical ribs in the Wiesbaden Museum, but says nothing about it; both handles have the pincer-fringe at the lower sticking-part.

Jugs of precisely the Turriff type are not very common in England. One with a plain body was found at Colchester and is in the British

¹ One or two handles of this type have been found in Britain (e.g. Corinium Mus. No. 55 A, width $\frac{7}{8}$ inch, height now $2\frac{1}{8}$ inches), but I do not recall an entire vessel.

Museum. One with spiral wrything and fringe, very near to Turriff, was found in Windsor Great Park in 1866, and is in the British Museum. A third British Museum example, from Box Hill, Milton-next-Sittingbourne (Kent), has vertical ribs and an applied medallion with mask, the latter a survival into the second century of a well-known type of the late first century (Brit. Mus., *R-B. Guide*, fig. 123 f., and *Arch. Cant.*, ix, 170); a Frontinus barillet, third century, found near an adjoining burial, suggests a late-second or early-third century date. An example from the Bartlow Hills (Essex) is figured in *Archæologia*, xxv., 1834, pl. ii., fig. 1; there was a Hadrian coin in the next tomb. Part of another was found in the Litlington cemetery (*Archæologia*, xxvi., 1836, pl. xlv., No. 8; earliest coinage that of Hadrian).

A family related to the jugs mentioned, but distinct from them, has a tall body like a dunce's cap and sometimes combines spiral wrything with vertical ribs on the body of the same vessel. Necks and handles resemble those of the Turriff family. A good example, with vertical ribs only, was found at Amiens (Froehner, *Coll. Charvet*, pl. xvi. 84), and is now in the Metropolitan Museum, New York. The vertical accent in these foolscap jugs is more marked than in the Turriff group and suggests that they belong mainly to the third century. There are two good examples in the Canterbury Museum, and traces are fairly frequent.

Placing Turriff in the series I should be inclined to date it middle or second half of the second century, since the fretfulness of the design is already well developed. There seems to be no evidence to show whether the jug was brought to Scotland before or after the Roman occupation ceased, but North British sites have provided so many evidences that Seine-Rhine glass was imported during the third century, that an example of this kind might well have come in the way of commerce and independently of the military occupation.

As for the place of manufacture, (1) Fremersdorf (*loc. cit.*) disowns the family as *gallisches Erzeugnis*. (2) Morin-Jean can produce no example of it from France, and in such museums as I have visited in the north of France I cannot recall one. (3) Examples occur repeatedly in the Liège-Namur area. (4) There is as yet no certain evidence that domestic and finey glass of this kind was made in Britain. Hence I would be inclined to fix upon a glasshouse or a group of glasshouses in the Liège-Namur area; where, incidentally, there has been a glass industry since the sixteenth century and earlier, and materials are found conveniently.

The nature of the industry in later times throws much light on the

industry in the Roman Empire. The light is one of analogy, but not dangerous, if one bears in mind the differences in social and economic structure. With the capture of Damascus by Timur, and the decline of Damascus fashions among the European nobility, Murano began to dominate the European glass¹ market about 1400. There were no Venetians in Britain until 1549, and there was no glass in the full sense British until about 1675. Nearly three centuries were necessary to learn this very peculiar job. During that period domestic and fancy glassmaking was a close, close-bred, migrant, international craft. In the ancient industry details of manipulation, the same gaffers' tricks, recur again and again in glasses found as far apart as Sidon, Cyprus, Egypt, Campania, Provence, the Seine-Rhine glassfield, and Britain. Such resemblances in the code of work point irresistibly to a dispersion of Syrian gaffers, a view which is supported both in literary sources and by epigraphic evidence. The Syrian racket in glass was certainly connected with the dispersion of the Jews—also a glassmaking people. One might regard it as part of a late commercial "revenge" for the Carthaginian failure to win the European market as a Semitic preserve. I would not like to suggest that the dispersion of gaffers under the Empire was always independent of local capital or of the ignorant native promoters whom we meet in Renaissance times. But as early as the fourth century we find a presage of *noblesse verrière*, privileges which imply the economic independence of the owner-gaffer. Only one branch of the ancient industry was completely Roman in character, the common "squares" which answer to the "bottles" branch of the National Federation. These plain and splendid vessels are design in industry, a refreshing change from the commercialised "genteel" of the Samian potters. They possess the same genius for utility as Roman roads and Roman lettering. Between their date² and the American bottle-machine one finds no other bottle industry in which the normal trade models are squares and cylinders. But to the gaffer these common squares were a vitreous crime.

The Turriff jug is a gaffer's job and has nothing Roman about it. Semitic in antecedents, it belongs to a stage in the glass progress when demand for the goods has become demand for the industry. The sedentary shapes and soap-bubble values of pure Syrian have given place to verticality and unrest. This manufacturer was working not for "Roman" fashion but for Celtic taste. He belonged to the movement which created the linear æsthetic of Northern Provincial sculpture.

¹ The reference throughout is to domestic and fancy.

² Inferior and infrequent after second century.

In terms of glass he has done the same thing. The play of light in the metal, the wrything movement of the spiral line, the fretfulness of the sticking-part, are the beginning of a new sales appeal. There is no nonsense here about "sincerity" or "expression." Turriff values are the result of working in someone else's mood, one of those exchanges of taste which can only take place over a counter.

THE BROCH OF MIDHOWE, ROUSAY, ORKNEY. BY J. GRAHAM CALLANDER, LL.D., F.S.A.Scot., DIRECTOR OF THE NATIONAL MUSEUM OF ANTIQUITIES OF SCOTLAND, AND WALTER G. GRANT, F.S.A.Scot.

(Read 12th December 1933.)

In the Orkney Islands there have been counted about one hundred and ten sites or remains of ancient structures which are believed to have been those of brochs. All that is now to be seen in many places is a grass-covered mound, sometimes with stones peeping through the surface. In these cases most of the stones of the superstructure have been carried away for building houses and dry-stone dykes, and many have fallen into the central court of the broch. On the shores of Eynhallow Sound, the narrow strait that separates the island of Mainland on the south from the island of Rousay on the north, about a dozen are to be seen. Six occur on the last-named island within a distance of 4 miles as the crow flies, and within a few yards of the flagstone rocks of the Old Red Sandstone formation which fall down gradually to the water's edge in a series of ledges or steps. These rocks provided a handy supply of good building material, as many slabs had been dislodged by natural causes and others could be levered or wedged off without much difficulty. Wedges of wood or even of iron might have been used. Though none of the latter has been found in brochs, the inhabitants of Midhowe might easily have had them, because, as we shall see later, they understood the working of the metal. We have been informed that wedges of wood driven in dry and allowed to swell by the absorption of sea-water have been used within living memory in Orkney to prise off slabs. The stones also break with a

natural fracture often leaving three straight edges, some at right angles to each other and to the bedding plane. In the neighbourhood of Midhowe and other brochs on Eynhallow Sound, it is quite plainly seen where slabs had been skinned off to furnish the stones to build them.

The three most westerly of these Rousay brochs lie on the farm of Westness, and are marked on the Ordnance Survey Map as North Howe, Mid Howe, and Broch, the first and third being less than 500 yards apart; Mid Howe, near the centre, stands 200 yards south-east of North Howe and 300 yards north-north-west of Broch. The stony mound of North Howe, partially covered with vegetation, covers a large space of ground, and probably encloses a considerable height of building, as well as numerous outhouses which surround it. Broch which is situated very near the ruins of a farm-steading of the same name, is reduced to a mere hillock, as not only have the stones been used to build the adjacent houses and stone dykes, but it has been encroached upon by the sea.

Midhowe broch occupies the whole landward end of a small rocky promontory which falls in gentle stages into the sea on the south-west shore of the island. This rocky point is bounded on each side by a geo,¹ that on the south, Stenchua Geo, being very narrow with perpendicular sides some 15 feet high, and that on the north, Geo of Broch, being wider and not so deep. The floor of the broch stands only about 28 feet above local low-water mark, so that when westerly gales were blowing the buildings must have been drenched with spray. Before excavation there was only a grassy mound about 18 feet high with stones sticking through the surface in places to indicate the building (fig. 1).

The story of the evolution of the broch was very difficult to unravel, and some points have not been satisfactorily explained, but two later reconstructions were identified, both in the inner court of the broch and in the outbuildings. Whether the later occupations, inside and outside, can all be correlated is not quite clear.

Originally the broch seems to have consisted of a round tower, the broch proper, built near the middle of the promontory, and a very massive wall of defence, with carefully formed ditches outside and inside, stretching across the neck of the rocky point, nearly from geo to geo. Later on groups of buildings were erected on the northern arc

¹ A geo is an opening in the rocks, frequently of no great width, into which the sea has access. Stenchua means stinking, and the name has been given from the stench that rises from the masses of seaweed that are usually found in it.

of the tower, between it and the outer wall, and on the north-western arc towards the Geo of Broch. The lower portions of the structures between the main building and the outer wall are quite well preserved, and still maintain a good height, except where they have been disturbed during later reconstructions, but those to which the sea has had access on the north-west and west are much dilapidated. Not only have the



Fig. 1. Midhowe Broch from the north after the commencement of the excavations.

outer extensions of the walls been swept away, but even the rocky foundations have been eaten into, the stone being soft in places.

THE BROCH.

The main building is much destroyed on the exterior, especially on the south where the outer face has entirely disappeared. This part, so far as present indications go, had not been protected by external structures, and so was more accessible to the builders of the houses and the long dry-stone dykes which are to be seen in the neighbourhood. The most of the outer face of the wall has now been laid bare; only a short section on the north-west, where, owing to a caving in of the building, it has been shored up by curious buttressing, has not



Fig. 2. Midhowe Broch: Wall of Broch and inner face of outer wall on the north-east side.



Fig. 3. Midhowe Broch . South-east side.

been excavated. It is still from 7 feet to 9 feet high near the doorway, and rises up to 10 feet on the north-east and eastern sectors (figs. 2 and 3). As is usual in brochs the wall has been built with a distinct batter on the outside. The tower is approximately circular, measuring externally 59 feet 6 inches in diameter from north-east to south-west, and 58 feet from north-west to south-east, and internally 32 feet 2 inches



Fig. 4. Midhowe Broch: Entrance.

and 31 feet 2 inches. The thickness of the wall on the south is 15 feet 3 inches at the base, on the south side of the entrance 14 feet 3 inches, and on the north-north-east 12 feet. On the inside the wall stands to a height of 12 feet to 14 feet 6 inches round most of its circumference, but, for a short distance on the south-south-west, it has been reduced to about 9 feet. In common with many other brochs there is a scarcement, in this case formed by two or three courses of projecting corbelled stones, the top of which is 11 feet above the floor of the inner court. In places it is 21 inches wide, which is much more than in some brochs. The scarcement is not visible round the complete circuit of the wall, because on the north-west it is obscured by a facing

wall built at a period later than the original construction of the broch.

Entrance.—The doorway faces north of west, and is in a fine state of preservation (fig. 4). On the outside it measures 6 feet 3 inches in height, 3 feet 7 inches in breadth at the bottom, and 3 feet 2 inches at the top. The entrance passage narrows to 3 feet at two checks meant to retain the slab door in position, the one on the right or south side being 6 inches deep, and that on the left 9 inches. These checks lie 8 feet 6 inches and 7 feet 5 inches respectively from the



Fig. 5. Midhowe Broch: Entrance to Mural Cell A, and door check in south side of passage, from the inside.

outside, a slight projection of the wall on the south side causing this difference in measurements. Behind the checks the passage has a width of 4 feet 3 inches which continues to the inner end. This entrance, which is paved, has been entirely lintelled, but from the checks to the inner end the stones are broken off and only the wall-holds remain. The outer lintel is a stone of good size, and measures 5 feet in length, 1 foot 3 inches in depth, and 11 inches in thickness: behind it are two more set on edge, and then three placed on the flat with vacancies between them. The outer three support the wall above and the inner three part of the floor of a small chamber above the passage. At the checks there is a slab set on edge and sunk to the floor-level across the entrance, and another 9 inches from the inner end.

Mural Cell A—On the south side of the passage, 15 inches in from

the check, is a low opening 5 inches above the floor, measuring 3 feet in height and 1 foot 8 inches in width (fig. 5), leading through a passage 2 feet 11 inches long into a domed cell, A, with its corbelled roof intact, in the thickness of the wall. The little chamber is quadrilateral on plan, the walls being slightly curved; that on the east lies in the same line as the wall of the passage into it. This little cell measures 6 feet, 6 feet 9 inches, 3 feet 9 inches, and 6 feet 3 inches on the north, east, south, and west sides, and in the centre it is 7 feet 9 inches high. Running through the wall into the main entrance passage, at a height of 2 feet 2 inches from the floor and 1 foot 3 inches from the north-west corner, is a squared hole 9 inches high and 7 inches wide. This is suggestive of a bar-hole, like those seen in many brochs, for the passage of the wooden bar which kept the stone door in position against the inside of the checks. Here, however, the hole is outside the checks and there is no corresponding socket on the opposite side of the entrance passage to receive the extreme end of the bar, and so its purpose is not apparent.

There was about a foot of debris in the cell, and a number of pieces of antlers of red-deer were found on the floor near the door and also stuck into crevices in the walls. A hammer-head of deer-horn (fig. 36, No. 1) was discovered high up in the debris which encumbered the short entrance passage, and part of a shale armlet on the ground level within the cell.

Mural Cell B—On the north side of the entrance passage, but immediately behind the check, is another low opening 2 feet 1 inch above the floor-level (fig. 6), measuring 2 feet 4 inches high and 1 foot 10 inches wide, giving access to a passage 2 feet 6 inches long which leads into a pear-shaped cell, B, with a corbelled roof, and a narrow gallery at its inner end, in the thickness of the wall. The sill of this entrance is 1 foot 9 inches higher than the floor of the cell. The chamber is 8 feet 9 inches high in the centre, and at its widest part measures 5 feet 6 inches across. Its walls gradually converge into those of the gallery, about 11 feet 6 inches from its southern end, and this may be taken as the length of the cell. In the wall of the chamber, on the west side, 7 feet 4 inches from the south-west corner and 4 feet 7 inches above the floor, is a bole or recess, 9 inches high, 7 inches wide, and 12 inches deep. About 14 feet in from the entrance to the cell, the gallery, which at this point is 6 feet high and 18 inches wide, has been deliberately blocked by stones set on edge, for a purpose which will be discussed later, after the primary occupation of the building. This packing of stones extends for a distance of about 10 feet. To get into the gallery for the purpose of tracing its farther

course we had to remove one of the lintels which formed the roof of the gallery and the floor of the chamber above it, opposite the foot of the stair.

Chamber above Entrance Passage.—Above the main entrance passage is a narrow chamber looking into the inner court through an opening 4 feet wide (fig. 6). Across the opening, at a height of 3 feet from



Fig. 6. Midhowe Broch: Entrance to Mural Cell B, and door check before excavation to floor-level.

its floor, there had been a tie composed of three slabs, and behind the upper one are the ends of the lintels which formed the roof. The chamber penetrates the wall to a depth of 9 feet 3 inches, and at the inner end it is only 2 feet 9 inches in width. The door checks seen in the entrance passage below are carried right up into the chamber, but they are entirely structural here. It is not apparent how access was obtained to this apartment, perhaps it was by a ladder or by the upper gallery.

Stair.—There is a doorway in the north-east, 5 feet 9 inches above

the floor of the broch, and 25 feet from the main entrance, wanting the upper part, but still showing a height of 5 feet 3 inches, and measuring 2 feet 9 inches in breadth at the sill. This leads into the foot of a stair, which, following the usual custom in brochs, turns to the right. Often its entrance is on the ground level of the building, but in the broch at Aikerness, less than $2\frac{1}{2}$ miles south-south-east, on the adjacent island of Mainland, the entrance to the stair is at a high level also. Fifteen of the steps remain in position at Midhowe. They rise 5 feet in their flight, and have a general width of 2 feet 3 inches. The stair doubtlessly opened on to an upper gallery within the wall, but at this part it has been completely removed. Opposite the foot of the staircase is a pear-shaped cell which extends 13 feet west from the left jamb of the door into the stair. It measures 4 feet in greatest width and 5 feet in height. This cell is not now correctly aligned with the stair, as it had sagged outwards owing to partial sinking of the outer face of the wall of the tower. It was also packed with slabs. As already mentioned, the roofing lintels of the lower gallery form the floor of the cell, and the lintels of its roof in turn served as the floor of an upper gallery. A chamber, with curvilinear walls, is very often met with in brochs opposite the foot of the stair.

Near the south-east part of the inner face of the wall of the tower is an opening 3 feet 6 inches from the floor, measuring 3 feet 1 inch in height and 1 foot 9 inches in breadth. Through it, after clearing out some secondary building at the back, it is possible to enter the lower gallery and also one above it, the roof of the first forming the floor of the second. But, owing to the reconstruction that has taken place here, it is not clear that it was intended for an entrance. The opening widens to 2 feet 6 inches, about 3 feet 9 inches in at a check on the left side. After removing the late rough building at the inner end, which was 15 inches thick, the inner wall of the two galleries was encountered.

Higher up in the wall and quite close to the scarcement, at a height of 7 feet 4 inches from the floor and 6 feet west of the last opening, is a hole measuring 15 inches in height and breadth and 21 inches in depth (fig. 13). It is too high to have been reached by anyone standing on the floor, and could only have been accessible by a ladder or some other contrivance which also could have been utilised to get into the staircase.

The Galleries.—There are the remains of two galleries within the thickness of the wall, one near the level of the floor of the broch and another about the height of the top of the scarcement. Possibly

there has been another between these two. We have seen that the cell B, on the north side of the entrance passage, led into a gallery which had been blocked up. Under the floor of the chamber at the foot of the stair the gallery is 3 feet 6 inches high and 2 feet 4 inches wide, but farther in the roof rises in height. After removing some of the stones with which it was packed it was possible to crawl into it a distance of 36 feet, and it has been proved to extend 15 feet more. It varies from 2 feet 6 inches to 1 foot 9 inches in width, and its roof stands from 5 feet to 6 feet 9 inches above the floor of the broch. The actual heights of the gallery and of its floor-level have not been ascertained, because we dared not clear it for fear of endangering the structure. All the way along the packing consisted of slabs set on edge which reached to within a few inches of the roof. What appears to be a further extension of this gallery has been excavated on the south, right down to its floor which stands 2 feet higher than that of the inner court of the broch. It is possible that this gallery has been carried nearly as far as the cell on the south side of the main entrance, as in the case of the broch, *Dun Beag, Strunn, Skye*. The thickness of the wall between the gallery and the inner face of the wall of the broch varies, but as seen on the eastern arc, a fair average is about 5 feet 3 inches, while that between it and the outer face of the wall of the building is about 7 feet.

The only indication of the intermediate gallery is to be seen behind the opening in the wall of the broch to the south, where it was found to be only 2 feet 9 inches high. Whether it extended to the north or to the south was not ascertained, owing to the danger of bringing down the outer wall which was in a precarious condition.

The higher gallery, which was built about the level of the present top of the stair, has almost entirely been removed, but there are indications that it may have almost completed the entire circuit of the broch. As the roof of the cell opposite the foot of the stair is lintelled and not corbelled, the presumption is that it also formed the floor of the gallery which extended southwards possibly as far as the chamber above the entrance passage. But two short sections can be traced, one on the south and the other on the west. The first section is about 2 feet wide, but the walls are reduced to a height of 3 feet on the inside and a few inches on the other side. Its inner wall is 6 feet thick. The other section is seen immediately to the south of the little chamber above the main entrance; only a short length of the inner wall remains, measuring no more than 2 feet 8 inches in thickness. It was thought that the small chamber might have been entered by way of the gallery, but its end is built up. There may have been an

opening in it some distance above the floor, but this is only mere conjecture.

Mural Cell at High Level.—On the level of the top of the scarcement, at its widest part on the south-east, is another doorway, 2 feet 4 inches wide, with its jambs reduced to a height of 3 feet. This is the entrance to a small quadrangular chamber in the thickness of the wall. Its eastern or outer side has entirely disappeared. The cell measures 7 feet 7 inches in length on the western side but increases slightly towards the east. About 4 feet of the northern end and 6 feet of the southern remain. At the west end of the south side there is a recess, 2 feet 6 inches long and 7 inches deep. As the walls are well bonded into the main building, at the first glance it looks as if it were part of the original lay-out of the broch, but lying in the centre of the wall, it would have completely blocked the upper gallery. As the end of the section of the gallery which lies behind the south wall of the chamber does not show a built face, it would seem that the building of the cell was subsequent to the original construction of the broch. It may be mentioned that doorways occur at the scarcement-level leading into galleries in the wall in other Orkney brochs,¹ e.g. the East Broch of Burray and the Broch of Borrowston, Shapinsay. There is nothing now left to indicate how the occupants of the last two brochs reached these doorways. But we shall see later that the Midhowe broch furnishes a possible explanation.²

Well or Cellar.—A not uncommon feature in brochs in Orkney and elsewhere is a well, quarried out of the rocky floor within the building. At Midhowe there is a very good example in the northern half of the inner court. It is practically rectangular on plan and lies east and west. At the mouth it measures 6 feet 10 inches in length and 4 feet 7 inches in greatest breadth, and it is 8 feet 6 inches in depth. The walls are almost vertical for 6 feet, about 2 feet 6 inches at the top being built, but towards the bottom, near the north-eastern corner, it contracts to 2 feet 6 inches by 1 foot 3 inches. At the north-west corner of the mouth is a step down, 2 feet long, 1 foot 9 inches broad, and 2 feet 9 inches deep. The mouth was covered by two large slabs, and the place of entry by a dressed slab, measuring 1 foot 9 inches by 1 foot 6 inches, which could be lifted. As there was only about a foot of drainage water in it, and there is no sign of it being supplied by a spring, a very surprising thing as we shall see later, the question arises whether it may not have been utilised as a cellar. Be that as it may, there is no doubt that such cavities in some other Orkney brochs were wells.

Owing to the reconstructions within the broch, which had entailed

¹ *Archæologia Scotica*, vol. v, p. 75, fig. 3, and p. 81, fig. 12.

² *Postea*, p. 461.

the clearing out of the floor, no signs of sockets for the posts that held up the inner end of the pent-house roof which rested on the scar cement were met with.

Hearth.—As it would have necessitated the removal of important structures which had to be preserved, we could only probe the 18 inches of material on the floor to try and locate the hearth that one expects to find in the middle of the court. There was no scarcity of burnt material here, which may be taken to indicate that there had been one.

SECONDARY BUILDINGS WITHIN THE TOWER.

At least two reconstructions can be traced in the inner court, one seemingly contemporary with a threatened collapse of the north-western part of the tower. To strengthen the building the whole of the lower gallery, from its entrance from cell B on the north-west round by the east and south, was blocked with slabs set on edge, a facing wall was erected against the main building from the north of the inner end of the entrance into the broch to within 9 inches of the doorway into the staircase, and a revetment of slabs placed on edge in a slanting position was built round the outside on the north-west.

From the earliest times the inhabitants of Orkney made full use in their building operations of the flagstones that are so widely distributed throughout the islands. Thin slabs were set vertically to form partitions or to face portions of the walls, and horizontally to make roofs. Partitions or roofs so formed are to be seen in Stone Age cairns, such as those at Unstan and Taiverso Thiek, and in some of the brochs and earth-houses of much later times. Perhaps the most striking features in the broch of Midhowe are the extraordinary secondary constructions erected inside the inner court, where very large slabs put up on end or on edge alternate with ordinary dry-stone building.

A line of large slabs set on end, running in an east-south-east direction, from a point 3 feet 10 inches from the northern side of the inner end of the entrance passage, and in general alignment with it, right up to the wall on the opposite side, divided the inner court into two compartments, C and D (fig. 7-7). The greater length of this partition is formed by five large flagstones placed upright, a short section of ordinary building, and three more flags on edge *en échelon* their ends overlapping by 2 inches to 3 inches. The slabs measure from 2½ inches to 3 inches in thickness. The first five stand from about 6 feet 6 inches to 8 feet in height above the rocky floor, three being about 4 feet 2 inches broad, and the last three about 3 feet



Fig. 7. Midhowe Broch: Interior from south-west. 1. Entrance, 2. Scourment, 3. Facing wall, 4. Alcove, 5. Stair entrance, 6. Fireplace at high level, 7. Divisinal wall, 8. Entrance to compartment B, 9. Socket stone in wall, 10. Hearth, 11. Tank, 12. Remains of stove, 13. Cubicle, 14. Modern buttresses.

10 inches in height. To keep the slabs in position, a narrow one, about 16 inches broad, is inserted at right angles or obliquely between the first and second, the third and fourth, and the fourth and fifth. Between the fifth and sixth is a pillar of dry masonry, 1 foot 7 inches broad, the extension of which runs for a distance of 15 inches more along the northern side of the seventh slab, and also along the top of the three end flags, its height here being from 15 inches to 2 feet. Above this bit of building, jammed in between the upper part of the pillar and the main wall, are two more upright slabs, 3 feet 10 inches and 2 feet 10 inches high.

Compartment C.—At the inner end of the entrance passage is a vestibule of quadrangular plan, with an average length and breadth of 5 feet and 3 feet 3 inches. An erect slab, 1 foot 8 inches high and 1 foot 7 inches broad, is inserted in the north side of the passage at its inner end, thus reducing the width of the entrance to 2 feet 6 inches. On both sides of the vestibule is a doorway leading into what may be termed a short lobby, from which access is obtained to the northern and southern compartments in the central court, and to a row of small cubicles which, there is every reason to believe, were built right round against the inner face of the main wall. The doorway on the north side of the vestibule is 1 foot 10 inches broad, and has a sill in the shape of a flag sunk into the ground. Behind the flag on the left side of this entrance, which is broken and measures only 8 inches in height, is a socket stone in position, which formed part of the lower hinge of the door, and in the corner behind it a triangular stone basin, the cavity measuring 11 inches long, 8 inches broad, and 2 inches deep. The right side of the lobby is formed by the back slab of a press entered from the inside of compartment C, and on the left is the facing wall before mentioned. This veneer of building is 1 foot thick at its south end, but swells out as it rises near the centre, and then attenuates to 9 inches thick (fig. 7-3). Just about the middle is a domed alcove, a very striking piece of architecture (fig. 7-4). The inner side consists of an erect slab, measuring 7 feet 6 inches in height, 2 feet 3 inches in breadth, and 2 inches in thickness, placed parallel to, and 3 feet 3 inches from, the wall, with dry masonry above it. The outer face of this is flush with the outer face of the slab, and from a thickness of 5 inches at the bottom gradually thickens upwards until it merges in the corbelled roof of the alcove (fig. 8). In the supporting slab is a hole, $2\frac{1}{2}$ inches in diameter, 3 feet 4 inches above the floor (fig. 9). The inner end of the alcove is formed by a slab 4 feet 9 inches high and 3 feet 5 inches broad, its lower half on the inner side being dressed off so as to leave an opening, shaped like the

quadrant of an ellipse, 5 feet 9 inches high and 1 foot 9 inches wide at the floor. This just allows room for a person to wriggle through into the adjoining cubicle. Above this slab are 9 inches of building, then another flug 3 feet 6 inches high; above this are 5 inches of building, with yet another slab, 2 feet 1 inch high, balanced on the top (fig. 10). The alcove measures 3 feet 3 inches broad, 2 feet



Fig. 8. Mithlawe Broch: Alcove.

6 inches deep, and 11 feet 3 inches high. The erection of this piece of building and of that at the eastern end of the central partition in the inner court of the broch must have been very difficult operations, and one marvels at the wonderful dexterity, and admirable control of their materials, displayed by the men who were able to set them up with what must have been very primitive appliances. Certainly these builders were far removed from a state of savagery. Another very striking piece of work is the insertion of a rectangular slab in the face of the wall beyond the alcove (fig. 9). This stone is placed

4 feet 6 inches above the floor, and measures 4 feet 7 inches high and 5 feet 7 inches broad. It is checked at the left-hand top corner to afford a better grip for the stones which were fitted into them. During



Fig. 9. Midhowe Broch: Outer corner of alcove, slab in facing wall, and cubicle below.

the winter after this part of the broch was excavated, this stone slipped down, fortunately without breaking, but it has been replaced and fixed behind with cement in such a way that no one can see that it has been disturbed, no traces of the fixing material being visible.

Beyond the alcove to the east there had been a series of small intercommunicating cubicles made of slabs and set up against the main wall, but in the collapse of the upper part of the broch most of them were destroyed, nearly all the flags being not only dislodged but broken. Adjoining the alcove are the remains of one or more of these cells, which give an indication of their dimensions. Two stones set in alignment



Fig. 10. Midhowe Broch : Outside of back wall of alcove.

concentrically with the wall of the tower give the breadth about 2 feet 10 inches, and two roofing slabs in position give the height about 5 feet. A divisional slab shows its edge placed about 12 inches from the wall, a space which would allow the inhabitants to pass from one cell to another. In the south-east corner of the room are two more aligned slabs set up 5 feet from the outer wall, which probably formed part of the end cubicle. To the right of the entrance to the stair, in the north-eastern arc of the wall, three wall-holds can still be seen from 5 feet to 6 feet above the floor. It may be recalled that the

living quarters in most of the wheel-shaped earth-houses in the Outer Hebrides consist of a single row of intercommunicating cubicles built around the wall, but although slabs are occasionally used in their construction, the partitions between the cells are formed of dry masonry.

Mention of a press has been made; it lies in the south-west corner of the room, C. The walls consist of erect slabs and the roof of a single one, the last being fire-fractured (figs. 7-6 and 12). When it was exposed during the excavations it was covered to a depth of 4 inches with burnt material. This seems to confirm the opinion that there was an upper row of cubicles round the wall, or perhaps an occupation when the court had been partially filled with fallen debris. The press measures 6 feet in height, from 3 feet 8 inches to 2 feet 0 inches in breadth, and 2 feet 8 inches in depth, internally; its doorway is 18 inches broad, and there is a stone shelf in it 21 inches above the floor. In the edge of the slab at the back is a cut semicircular cavity $2\frac{1}{2}$ inches in diameter, through which one can see into the main entrance passage. The inner upright flag at the north-east corner projects beyond the north wall of the press, and is aligned with the western edge of the upright slab on the south side of the alcove. The opening between them is 3 feet 6 inches wide, and this formed the inner door into the north room. As there is a cavity cut out near the top of the slab in the alcove at the level of the top of the opposite one, which has a corresponding notch, it is considered that the doorway may have been provided with a lintel, its height above the floor being 6 feet 2 inches. A slab, 9 inches high, sunk on edge into the floor forms the sill. Inside the jamb on the south side is the socket stone for the hinge of the door.

The remains of the kerb of the north-east side of a hearth, made of small stones set on edge, are to be seen on the floor near the centre of the south side of the room. This partly overlaps one of the large slabs covering the mouth of the cellar. Superimposed on, but not exactly covering the first hearth are the remains of the kerb of a later one. Against the outside of the middle of the kerb on the south-east side of the late hearth is a socket formed by four small stones set on edge. As we shall see from a similar arrangement in one of the hearths in the south room, there is no doubt that there would be a corresponding socket on the opposite side of the fireplace. Presumably these sockets had uprights inserted in them to support a cross-bar from which cooking appliances or joints of meat could be suspended over the fire.

About 14 inches south-east of the last hearth is a tank, trapezoidal on plan, and measuring 2 feet 4 inches long, 1 foot 10 inches broad, and 1 foot 3 inches deep, formed of four slabs set on edge and sunk

into the floor. A layer of peat-like matter, in places 5 inches deep, covered a considerable area of the rocky floor of this room. This carpet consisted of heather and grasses which had been added to layer by layer as the lower ones got trampled down.

In the lobby leading into this compartment, at the floor-level, were found a weaving comb (fig. 26, No. 1), an awl or borer, a chisel-ended implement (fig. 27, No. 6), all of bone; a deer tine with a deep slot cut in the broad end (fig. 37); a tube formed from a leg bone of a large bird (fig. 20, No. 3); a perforated haft-plate of cetacean bone, half a



Fig. 11. Mould of Comb in Peaty Matrix.

rotatory quern, the last just within the doorway; two displaced socket stones; and five pot-lids lying near each other.

Near the west end of the cubicle below the large slab inserted in the face of the wall, a chisel-ended tool (fig. 27, No. 2) was recovered. About its centre, lying against the wall, part of the skull and the horn cores of an ox (*bos frontosus*), the first recorded in Great Britain; near the east end, two weaving combs, one (fig. 26, No. 3) at the floor level, and the other (fig. 26, No. 9) 5 feet higher up and slightly to the west of the first; and, outside the eastern end, a whorl and a partially perforated pebble were unearthed. A saddle quern and a pot-lid were also found.

A considerable number of relics were found in the peat-like layer which covered the floor. A chisel-ended tool (fig. 27, No. 5), three pins or borers of bone, and two deer-horn picks came from the eastern side of the apartment; two pieces of Samian ware below the entrance

to the stair : a weaving comb (fig. 26, No. 8) and its peaty matrix (fig. 11), a chisel-ended tool (fig. 27, No. 3), and a bronze pin (fig. 43), immediately north-east of the small tank in the floor; a stout bone borer (fig. 29, No. 1) and a whetstone between the tank and the divisional wall; and half of the head of a pin of morse ivory near this wall to the south-east of the tank. A haft-plate of deer-horn with two perforations in it (fig. 37) was found close to the weaving comb. A pot-lid and three stones of rotatory querns were found on the floor-level and a saddle quern and two stones of rotatory querns at a higher level.

Compartment D.—This room, which occupies the southern half of the inner court of the broch, like the one on the northern half, has a lobby opening off the south side of the vestibule at the inner end of the entrance passage. The door into it is 2 feet 4 inches wide, has a slab sunk to within 9 inches of the floor level as a sill, and is flanked on the west side by an erect flag 1 foot 5 inches in breadth, and on the east side by another 1 foot 3 inches in breadth. Behind and at the level of the top of the sill the lobby is paved. There are the remains of what may have been a double row of cubicles on the south-western arc of the building, but the existing parts are very fragmentary. As there are surviving parts of a double row of similar constructions on the eastern side of this room, it is just possible that this double row of small cells had continued right round the chamber, although every trace of them has disappeared on the southern arc. There are, however, a number of wall-holds here at varying heights from the floor, which suggest a roof of a cubicle here.

The lobby gives direct access to the outer row of cubicles, as in the northern half of the court, and, on turning to the east, to the inner room. Here there is a low step cut out of the rocky floor. On the left is a stall, 2 feet 3 inches wide, formed by the slab at the inner end of the vestibule, the first divisional flagstone, and another, 2 feet 6 inches wide, projecting from it near its eastern edge. This slab also forms the northern jamb of the doorway into the compartment, D, the southern jamb consisting of another erect slab placed nearly in alignment at a distance of 2 feet 6 inches from it, which gives the width of the door (fig. 7-8, and fig. 12). This, like others described before, has a sill made of a slab on edge sunk into the floor, which forms a low step up into the chamber. Immediately behind the jamb on the north side is part of another socket stone *in situ* for the hinge of the door (fig. 7-9).

The remains of two of the cubicles of the inner row survive on the western curve of the room. They are both quadrilateral on plan and are of small dimensions. The roofing slabs have disappeared. The one on the north measures 4 feet 7 inches in greatest length and 2 feet

6 inches in breadth, and the other 2 feet 8 inches by 1 foot 10 inches. The opening into the first, which faces the centre of the court, is 2 feet broad, and is reached by three low steps down, the one at the top having a curved korb of small stones set on edge.

On the opposite side of the compartment, in the angle between the divisional wall and the main building, to the south-east, are the remains of one or more cubicles, 2 feet 4 inches in breadth, which



Fig. 12. Midhowe Broch: Press in compartment C with fire-fractured slab on roof, and lobby and doorway into compartment D.

retain some of the roofing slabs. In front of these is a larger cubicle, 7 feet 6 inches long, 4 feet 9 inches broad at the north end, and 2 feet 10 inches at the south (fig. 7-13). The entrance, which is placed near the northern end, is 3 feet 1 inch in breadth, and has a slab sunk into the floor for a sill. Above this group of cells are the five upper steps of a staircase still in position; the lower part had been completely destroyed (fig. 7-12). This stair would give access to the high level mural cell, as it is immediately below it, and thus supports the suggestion that the cell was a late intrusion.¹ Placed roughly at

¹ *Supra*, p. 451.

right angles to the divisional wall across the court is one erect flag and two others sunk to the floor-level. Round the south-west segment against the main wall is a well-built drain, about 2 feet wide, with some of its cover-stones in position at its eastern end. It seems to have run towards the main entrance passage, but its outlet could not be found.

Near the centre of the room, as in the one in the northern half of the court, are two hearths outlined by stone kerbs, the upper partly superimposed on the lower. The earlier, which lies to the south of the centre of the apartment, with its axis east and west, shows a length of 6 feet 5 inches of its southern kerb and part of the eastern one. Against the outer edge of the south kerb is a socket formed by small stones set on edge. The later hearth is smaller and overlies the north-east corner of the earlier one (fig. 7-10). It lies north-west and south-east, and the kerbs on the sides and one end survive. It measures 4 feet 6 inches in length and 3 feet 3 inches in breadth. Outside the centre of each side is a socket similar to the surviving one in the hearth beneath it and in the upper hearth in the adjoining room. These sockets are rectangular, their cavities measuring about 5 inches by 3 inches. Running obliquely from the drain just described towards the lower hearth are two flue-like constructions, their openings at the side of the drain measuring 10 inches and 12 inches wide and 3 inches deep. To the east and slightly underlying the north-east corner of the upper hearth is a beautifully constructed tank formed of slabs sunk on edge to the floor-level lying north-west and south-east and measuring internally 3 feet 6 inches by 2 feet 4 inches and 2 feet in depth (fig. 7-11). Its nicely fitting lid was made from a dressed slab, but this was broken by a visitor to the broch. It retains about 1 foot of water, which evidently must be supplied by a spring, as it remained clear and drinkable all the years the work of excavation was going on. We have seen that the deep cavity in the northern compartment contained only a small quantity of drainage water although its bottom is 7 feet deeper than that of the tank just described. Presumably the fissure in the rock by which the water reaches the small cistern does not extend into the northern half of the court. As one corner of the later hearth encroaches on the edge of the tank it would appear that the latter was the earlier construction.

About $5\frac{1}{2}$ feet above the foot of the main wall to the south-west was a large slab projecting downwards from it towards the inside of the court (fig. 13). Above it was a mass of building extending inwards from the wall and terminating in a slightly obtuse angle. This seems to have belonged to a very late period of reconstruction in the broch

after it had been filled to a depth of 5 or 6 feet of debris. The inclined flag had very likely formed the roof of one of the lower cubicles. As we had to discover what kind of structure lay under the flag, and as it could not be supported, we were compelled to remove it.

In the lobby a saddle quern and two socket stones were brought to light.

Against the foot of the divisional wall, to the east of its centre, were found two weaving combs (fig. 26, Nos. 5 and 6) lying together, and a



Fig. 13. Midhowe Broch: Roofing slab of cubicle in south west side of compartment D, during excavation.

whetstone a few inches to the west of them; a weaving comb (fig. 26, No. 7), a bone pin, a bone ring (fig. 32, No. 3), seven pot-lids, and a stone of a rotatory quern, in the cubicle in the north-east corner; four whorls under the large opening in the wall to the south-west of the latter; a whorl of cetacean bone, several pieces of a paddle bone of a large whale, and a Roman patera of bronze smashed to pieces by falling stones, outside the eastern end of the drain on the south; and a ring-headed pin of bronze a few feet farther west. All were lying near the floor, except the patera, which was found 18 inches above the whorl of cetacean bone and the paddle bones of the whale. On the floor within the south side of the door into the chamber was a hollowed stone or mortar. The fragments of the pot, fig. 48, were found close to the wall of the broch, 2 feet above

the floor, in the southern arc. A hollowed stone, two detached socketed stones, a whorl, and a bone chisel, came from the western half of the apartment.

OUTER WALL AND DITCHES.

The outer wall is of extraordinary strength and a most impressive structure, even though its upper portion has been removed. It is built in a flat curve across the neck of the promontory, with its north-western



Fig. 14. Midhowe Broch: South end of Inner Ditch showing late walls built across it.

end resting on the edge of the Geo of Broch, and its southern extremity standing on the edge of a vertical face of rock 5 feet high, and 17 feet from the brink of the Stenchna Geo. The outer face then turns west along the edge of the rock, and, judging from the style of the building in places, we think we were able to trace it a distance of 23 yards, beyond which it had been entirely removed. On the landward side, facing the north-east, the wall measures 47 yards in length. Rising with a slight batter the outer face still stands, for a considerable length, from 5 feet to 7 feet in height above the bottom of the ditch outside. On the inner face, which is built with a more decided batter, it is about 10 feet high (fig. 14). For the greater part of its length the width

at the top is about 19 feet and at the foundation some 26 feet. At its nearest point to the tower its foundation is $8\frac{1}{2}$ feet distant. Nearing its southern end the inner face of the wall takes a sharp curve to the west and then to the south (fig. 14). If the present entrance passage, J, is a secondary construction cut through the wall, a doubtful point, this defence would have been 31 feet thick at one place. It is difficult to understand why the southern end of the wall was not carried to the edge of the Stenchua Geo. Possibly the great height of building which



Fig. 15. Midhowe Broch: North-western end of Ditch showing vertical joint in wall in the right of the foreground, and clay counter-scarp with stone revetment above in the background.

would have been required on the lower shelf that occurs here precluded it from being built.

The outer face of the wall towards the landward side is constructed in an unusual way. On the outside the stones are laid on the flat in the ordinary fashion, but within this skin, as can be seen where there is a break, the flagstones are set vertically and radially, as in the peculiar buttressing seen in figs. 17 and 20. About 6 feet from the north-western end is a straight vertical joint (fig. 15), but as the bottom of the ditch outside at this part has been paved, as we shall see later, at a time subsequent to the erection of the main part of the wall and the paving slabs go under the foundation of this short stretch only, it is quite

evident that this part was built at a later time. This may have formed the original entrance to the broch, but we have to consider another opening leading into a long narrow passage through the wall 16 feet from its southern end. This shows later building on both sides, and there is no doubt that it formed an outer entrance into the broch after some of the secondary structures had been built. However, the outer ditch dies out towards its southern end, where it approaches this doorway, which suggests that it may have been part of the original plan of the broch.

About 36 feet west of the south-east angle of the wall is a flight of



Fig. 16. Midhowe Broch: Earlier wall across south end of Inner Ditch.

steps cut out of the rock, diminishing in width from 4 feet 3 inches at the bottom to 2 feet 1 inch at the top, where it opens into the present entrance passage, and 19 feet 9 inches farther on is a broader set of steps also cut in the rock, but these are blocked at the top by late building.

The outer ditch, which has been dug into a yellowish clay, measures from 8 feet 3 inches to 11 feet in width at the mouth, and the flat bottom 3 feet 6 inches. On the counterscarp the clay has been cut in a convex curve, and this has been surmounted with a stone revetment, the remains of which have been traced in various places. At the north-western end, however, there is a well-built retaining wall still, 2 feet 9 inches high (fig. 15). The last 48 feet of the north-western end of the ditch has been paved with flags at a time later than the erection of the wall; and towards the southern end of the pavement, on the landward side, is a construction of stones the purpose of which is obscure. Under

the pavement is a hollow, about 12 inches in depth, the paving flags being supported by blocks of stone.

Within the wall is the inner ditch which extends from its north-western extremity to where it strikes west near its southern end. The scarp is faced with stones built with a slight batter, and the counterscarp is formed by the inner face of the outer wall. It measures about 32 yards in length, and its depth is about 10 feet below the present top of the wall and 3 feet below the foundation course of the broch. At the mouth it varies from 11 feet 6 inches to 8 feet in width as it proceeds north, and at the bottom from 6 feet 6 inches to 2 feet. Where it most closely approaches the tower, the space separating them is only 3 feet 3 inches wide. For about half of its length towards the north the ditch is now covered by secondary buildings, but it has been traced within chamber H, and a short length is seen at the northern end.

Near its southern end there are two late walls of inferior masonry built across the trench. About the centre of the earlier and more southerly one is what may be termed a stone ladder of six steps (figs. 14 and 16). About $7\frac{1}{2}$ feet in front of this is the second wall (fig. 14). We have not been able to correlate these structures with the rest of the buildings.

Entrance near South End of Outer Wall.—About $15\frac{1}{2}$ feet from the southern end of the outer wall is a doorway, 3 feet 6 inches wide, which leads into a long passage, J. The width of the doorway has been contracted by secondary building on each side. The passage, which runs about 53 feet between walls still standing to a height of from 3 feet 6 inches to 4 feet 3 inches near the entrance and from 1 foot to 2 feet farther in, strikes generally in a westerly direction tangential to the outside of the southern curve of the main building of the broch. For considerable lengths on both sides it is faced by late masonry. From the entrance it maintains the same width, 3 feet 6 inches, for 4 feet 4 inches, where it widens out to 5 feet 4 inches, there being a cheek 9 inches deep on the north side and another 1 foot 3 inches on the south side. At this place two thin flagstones are sunk into and across the floor, with a vacancy between them. The walls on both sides now curve slightly to the south, the curve on the north being rather sharper at the inner end. This part of the passage is 8 feet 9 inches in length and 6 feet 9 inches across at its widest part. Hitherto its direction has been south-west, but it now alters to almost due west for the remaining part, a distance of about 40 feet. On the left or south side there is a recess 2 feet in length and 6 inches in depth, then 3 feet farther on a cheek 9 inches deep, immediately behind which is an annery 8 inches in breadth and 10 inches in depth. From

the cheek the wall runs in a straight line for 20 feet 4 inches, where there is an opening, 2 feet 6 inches wide, leading into the rock-cut staircase already referred to.¹ The opening at the top of the stair is blocked with a flag measuring 3 feet 4 inches in breadth, 2 feet 9 inches in height, and 3 inches in thickness. Beyond the stair the wall continues for 6 feet 9 inches, with a hrench, 3 feet 9 inches wide, and a further length of 4 feet 9 inches. Both of these sections are built on a slight curve, the convexity being towards the passage.

On the north side of the passage after the wall curves in towards the south it strikes almost due west for 5 feet 3 inches, a slot 6 inches wide and 10 inches deep occurring opposite the aunry on the south wall. At this place the passage narrows to a width of 4 feet 6 inches. The wall, which has a flat slab inserted at the return, now strikes backwards in an obtuse angle for 5 feet 1 inch, and continues west for 6 feet 10 inches, where it breaks forward a distance of 1 foot 9 inches. It now goes west in an irregular line for 20 feet, where, like the opposite wall, it runs into disturbed material. The average width of the passage for the greater part of this length is 8 feet 3 inches. At a distance of 11 feet from the present termination are two upright slabs in the wall which project 1 foot into the passage. The walls on both sides are poorly built, but that on the north side is much inferior to that on the other.

The relics found in the outer ditch included a penannular brooch (fig. 45), near the south end; another, fractured and crushed (fig. 44, No. 4), in front of the south entrance; half of a stone whorl, three pot-lids lying together, a whetstone, and part of a human skull, within a few feet of each other near the centre of the trench. All except the whetstone and whorl, which came from the bottom, were recovered in the filling of the trench from 2 feet below the surface downwards. A saddle quern was found in the break in the outer face of the main wall. Two pot-lids lying together, and a saddle quern, near the north-western end of the ditch, and two detached socket stones, opposite the south end of the wall, were found at the bottom level, as were a considerable number of animal bones, fire-fractured pot boilers, four hammer-stones, and a pointed bone tool.

A fair number of tools and other objects were discovered in the inner trench, and on the path between it and the tower. Two painted tools and a pin of bone were found high up on rock near the south end. At lower levels were a saddle quern near the wall of chamber H; two boar's tusks, half of a whorl of pottery, a chisel-ended tool, a small polishing implement, and a small worked scapula (fig. 32, No. 5), all of bone.

¹ See *supra*, p. 469.

and part of a cup fashioned from a whale's vertebra, near the outer side of the trench about the centre; a saddle quern and a pot-lid, close to each other, towards the south end. Part of the skull, horn cores, and a vertebra of an ox (*Bos frontosus*) on the inner side not far from the south end. This was the second occurrence of *Bos frontosus*.

On the path, at a higher level, were discovered part of a small-toothed comb of bone (fig. 32, No. 1), a bone pin and the point of another, two pointed bone tools, a small rounded hollowed stone, part of a saddle quern, and three hammer-stones.

In the continuation of the path towards the west which is now blocked up by buttressing there were found a penannular bronze fibula (fig. 44, No. 5) opposite the middle of chamber H. and a weaving comb and hollowed stone opposite the inner end of chamber F. •

Relics were extremely scarce in the long entrance passage J, as only one bone pin, a whetstone, a piece of steatite and a small fragment of a crucible were recovered, and these were found at its inner end near the tower.

THE OUT-BUILDINGS.

There is a group of buildings of most irregular plan occupying the narrow space between the tower and the Geo of Broch to the north-west and the outer wall to the north. All are secondary constructions, and two periods of building are clearly discernible. Those on the north-west, chambers E, F, and G, have had their outer segments facing the sea entirely swept away by the waves, but the complete outline of the one to the north, chamber H, is well preserved.¹

The character of the building in these four chambers differs from that of the tower, but it is still very good. We now find slabs occasionally built in as a facing to the walls in places, and bonded into, and projecting from them, at times, structural features that do not occur in the broch in its original condition. The latest work is much inferior to that seen in the tower or in these four apartments.

Chamber E.—Judging from what remains of this, the most southerly chamber, it seems to have been sub-oval on plan. The wall on its inner side curves round from north to south, the chord measuring about 26 feet in length, while the width of what survives is about 10½ feet at most. The entrance seems to have been in the south-east, but it is now blocked by late building. It measures 2 feet in width. The wall is from 2 feet 6 inches to 4 feet thick and stands about 3½ feet high. Near its present northern end is an annery, wanting its upper part, 2 feet 3 inches from

¹ As this chamber has been divided into several compartments in later times, these have been numbered H1, H2, and H3, to facilitate their description.

the floor; it measures 19 inches wide and 2 feet 1 inch deep and widens towards the back.

The late piece of building blocking the doorway on the south-east measures 7 feet in breadth and projects $5\frac{1}{2}$ feet into the chamber. Its walls on the north and south are curved. In front is an umry, 17 inches wide and 15 inches deep, placed 2 feet 2 inches from the floor, and to the right of it a peculiar recess, the north side and the back built straight and the south side curved. It measures 1 foot 10 inches deep and the same in width at the back, but the opening is only 6 inches wide. The purpose of this recess is not easy to explain, as it is difficult to reach the inner end with the arm outstretched.

A chisel-ended implement of bone was found on the south-east side of the chamber, a hollowed stone 8 feet to the north, and a saddle quern below the doorway, 5 feet farther on, all at the floor-level.

Chamber F.—This is a long narrow chamber with straight walls on both sides, running roughly north and south. It widens from 4 feet 9 inches at the inner end to 11 feet at its broken outer extremity. The wall on the west survives for a length of 13 feet and that on the east for 22 feet 6 inches. The latter averages about 2 feet in height and 2 feet in thickness. Some $6\frac{1}{2}$ feet from the end of the east wall is an upright slab bonded into it and projecting 10 inches into the chamber. In the wall opposite is a similar flag. The original entrance, which was in the narrow south end, measured 3 feet 6 inches in width, but it has been blocked up (fig. 17). Immediately inside it, in the west wall, is a recess, 7 inches wide and 15 inches deep, which may have been a bar-hole. At the outer end of this wall are the remains of an umry. This chamber has also undergone reconstruction in places. In front of the blocked doorway two flags, 9 inches in height, have been sunk into the ground on edge and now form a trough-like structure, 3 feet 6 inches long and 14 inches wide (fig. 17). An opening has been made near the inner end of the east wall, and an irregularly shaped cubicle has been inserted



Fig. 17. Midhowe Broch: Blocked-up doorway into chamber F, showing buttressing behind and trough-like structure in front.

so as to occupy the inner end of the adjoining chamber G, blocking up the entrance into its narrow end. This cubicle is four sided, with an average length and breadth of 6 feet 7 inches and 5 feet 6 inches. For the greater part the walls are lined with flags, but part of the northern side consists of a wall, about 1 foot thick, built in a flat curve. The opening into the cubicle has flags set on end as jambs, and measures 1 foot 7 inches in width. Some 2 feet 6 inches from the north-east corner is a slab, 1 foot 6 inches wide, which projects towards the inside. Between it and the east wall is a stone shelf 9 inches from the floor.



Fig. 18. Midhowe Broch: Outer end of east wall of chamber G and two floor-levels.

Part of the roof formed of flagstones still survived when excavated, and gave the height of the cubicle as 6 feet. At the north side of the entrance to this little cell is a box-like structure formed of slabs set in the floor, measuring 2 feet 10 inches in length and 2 feet 3 inches in breadth. The slabs on the south and west sides are 2 feet 1 inch and 1 foot 3 inches high, but the two on the north side are reduced to 4 inches and 7 inches. About 4 feet to the north-west, near the centre of the chamber, there seems to have been a somewhat similar structure, but the slabs do not appear above floor-level. Two survive on the south side, set in line, and two on the north end, placed obliquely.

A hone holer was found on the floor in the south-west corner of the chamber, a hollowed stone near the box-like structure on the floor on the eastern side of the room, and a socket stone at the west side of the

blocked-up door. A whorl and a socket stone came from the cubicle occupying what was originally the inner end of chamber G.

Chamber G.—This apartment, like chamber F, lies roughly north and south. The entrance was in the south end and measured 3 feet 3 inches in width. The common wall between them, as we have seen, runs almost straight, and it stands only about 1 foot 10 inches high, as the floor of this chamber is higher than its neighbour on the west. There are neither projecting slabs nor anneries in its surviving length.

The wall on the east side follows a very irregular course. It reaches a height of 6 feet and measures from 2 feet to 4 feet 3 inches in thickness. The northern end of the wall encroaches on the scarp of the inner ditch, running in a north-westerly direction. It curves round to the south-west for a distance of 14 feet, where its course is interrupted by a large slab, 6 feet in greatest height, projecting 2 feet 7 inches into the interior (fig. 18). In the northern part of the wall is a double annery, 2 feet 11 inches from the floor, measuring 2 feet 2 inches high, 16 inches broad, and 16 inches deep, with a stone shelf inserted across the centre (fig. 18). There are the remains of another annery at the level of the bottom of the first, 2 feet to the north-west. From the south side of the projecting slab the wall curves in a southerly direction for 7 feet, where there is another projecting slab, beyond which it continues in a straight line to the inner end for about 14 feet, but 2 feet 6 inches from the last upright flag is another projecting obliquely into the chamber. Half-way between them is an annery, 2 feet 9 inches from the floor, measuring 17 inches high, 13 inches wide, and 12 inches deep.

The inner part of this chamber, as already mentioned in describing chamber F, is occupied by a late cubicle which was entered from the latter. This cubicle blocks the original doorway and is built upon kitchen-midden refuse.

The floor of the inner part of chamber G—that is, between the first-mentioned projecting slab in the east wall and the intruded cubicle at the back—is 1 foot 6 inches higher than that of the original one. The higher floor is paved and seems in places to have been supported with stones set on edge, because in the south-east corner it is hollow underneath, about 5 inches of ash-like material which had percolated through between the paving stones being found under them. In the centre of this part of the chamber is a hearth which was covered with masses of iron slag (fig. 19). The west and south sides are formed of large slabs set on end which have been badly fractured by heat. Running tangentially from the west edge of the hearth in a northerly direction are the remains of a drain-like structure formed of flags set on edge, with the bottom paved, measuring 8 feet in length. Only two slabs

survive on each side, the central pair being opposite each other. They lie $4\frac{1}{2}$ inches apart at the bottom and 6 inches at the top. The bottom of this structure is 1 foot 8 inches below the top of the hearth. It has been suggested that this may have been the flue for the air blast into the furnace, but owing to the fracturing and collapse of the stones by heat its complete course could not be traced.

In the angle between the inner end of the supposed flue and the hearth was a clay pot, $11\frac{1}{2}$ inches in height (fig. 47), sunk into the floor, its base being 2 inches deeper than the bottom of the flue. To the



Fig. 10. Mldhowe Broch: Chamber G from the north-west, showing smelting hearth and nursery in the east wall.

east of the hearth was a pocket in the floor, 1 foot 8 inches deep, filled with churecoal and ash.

Near the centre of the inner end were found a small hollowed stone, perhaps a lamp, between it and the smelting hearth a pot-lid, and to the east of the hearth two boar's tusks.

Chamber H (H1, H2, H3, and H4).—The adjoining chamber, H, on the east is the largest of the four. It is sub-oval on plan, being widest near the west end. It measures 43 feet in greatest length and $28\frac{1}{2}$ feet in greatest breadth. Its walls still maintain a height of from $4\frac{1}{2}$ feet to 5 feet. To make room for its wall on the north side a width of as much as 8 feet of the inner side of the outer wall of the broch has been removed in places, and the bottom of the inner trench has been

filled in to a depth of $2\frac{1}{2}$ feet. There is no doubt about this chamber and the other three just described being of later date than the tower and the outer defences.

Commencing in a right angle in the south-west corner of the chamber the wall sweeps round the west end and north side in a series of curves and re-entrant angles, with erect slabs projecting inwards from the wall at two of the breaks. The wall at the east end is nearly straight, as is



Fig. 20. Midhowe Broch: East end of south wall of chamber 11, showing late doorway slapped in wall and entrance to compartment 11a in front.

that on the south side. The latter, however, shows three breaks in its course. The former, $5\frac{1}{2}$ feet from the south-east corner, measuring 3 feet in width, may have been a late doorway into the chamber (fig. 20). Some 5 feet 3 inches farther on to the west is a space, 6 feet 4 inches wide, blocked by a large slab, now split, set on edge. Extending from its western side there is a length of $12\frac{1}{2}$ feet of good building with a gap near its centre, about 4 feet 1 inch wide, blocked with late building. It is possible that this may have been the original entrance into the apartment.

It can hardly be imagined that such a large chamber as this was not originally divided into two or more compartments, but extensive recon-

structions have taken place in later times; and, although in the south part there are two short sections of good walling which may be contemporary with the first lay-out of the chamber, so much of the interior is occupied by late work that no traces of earlier divisional walls have been identified.

Slightly to the north of the centre of the chamber is a cellar, its lower part quarried out of the rock. As it encroaches on the line of the inner ditch, and is sunk into it, it must have belonged to a later period, and was almost certainly constructed when chamber H was erected.



Fig. 21. Midhowe Broch: Outer face of south-east corner of chamber H.

The cellar is pentagonal on plan and lies north and south. It measures 4 feet 3 inches in length, 3 feet 6 inches in breadth, and 3 feet 11 inches in greatest depth. At the north end there is an extension of the cavity for another 18 inches, with a breadth of 2 feet 5 inches and a depth of 2 feet 1 inch. This would give access to the cellar. The whole was covered with flags, but only the one covering the extension was lifted by us. During a subsequent occupation this cellar was covered up when later structures were erected.

In fig. 21 is seen the outer face of the south-east corner of this chamber as well as part of an aumry in the wall. This also gives a good idea of the fine material the broch builders had at their command.

Chamber H has been broken up later into four sections, H1 to H4,

by divisional walls of inferior masonry, from $4\frac{1}{2}$ feet to 5 feet high, and a cubicle has been erected in the south-west corner. Three of the sections only were meant for human occupation, H1, H2, and H3.

The cubicle in the south-west corner is quadrangular, measures about 4 feet 6 inches each way, and for the greater part is formed of slabs set on end.

Compartment H1, occupying the north-western corner of the chamber, is crescentic on plan, and measures about 16 feet 6 inches in length and 6 feet 6 inches in greatest breadth. The secondary wall forming its eastern side stands 3 feet 6 inches in height and measures from 18 inches to 3 feet in thickness. It follows an irregular course and contains upright slabs projecting from it and inserted against its face in places. Between its northern end and the main wall of the chamber is a low passage, lintelled in parts, 7 feet long, 18 inches wide at the narrowest part, and 3 feet high. This seems to have formed the entrance to the compartment.

Jutting out from the main northern wall of the chamber are two others which converge towards the south and enclose a triangular area truncated at the southern apex. The western of these two walls, which forms the eastern side of section H2 and is built in an ogee curve, is 17 feet 6 inches long and 4 feet 4 inches high. It stops short 1 foot of the northern wall as if to allow of a passage eastwards, but this is blocked at its inner end by a transverse slab and another set up against it at right angles on the farther side. Against the foot of the wall is a box-like setting of slabs set on edge, measuring about $3\frac{1}{2}$ feet by 18 inches. The slabs vary from 11 inches to 2 feet in height.

The wall on the east forms the western side of compartment H3, which is of irregular oval plan and measures $15\frac{1}{2}$ feet by $13\frac{1}{2}$ feet. The wall is curvilinear and stands 5 feet high.

In these two walls there are no less than fourteen aumries, five in compartment H2, two at the truncated southern part, and seven in compartment H3. Two of the last are placed immediately below two above (fig. 22).

Against the northern wall of the compartment H3 is a short flight of stone steps leading up towards the top of the outer defensive wall (fig. 23). At the northern end of the eastern wall is a built-up opening, 2 feet wide, which may have formed an outlet to the wall-head before the stair was built.

The southern end of the compartment has been formed of slabs set on end, with a gap 2 feet 6 inches wide to form the doorway (fig. 20). Outside this entrance and immediately to the west is another opening between two slabs set on end, opposite and aligned to each other, which



Fig. 22. Midhowe Broch : Aunries in west wall of compartment H3.



Fig. 23. Midhowe Broch : Stair in compartment H3.

leads into H2. It measures 2 feet in width. Behind the slab which forms the northern jamb is another socket stone in its original position.

The area marked H4 does not seem to have been meant for occupation after the late reconstructions had been effected in chamber H, as the backs of the walls are ragged and the space enclosed by them has been filled in burying the cellar in the floor.

Considering the large area occupied by chamber H, the relics found in it were disappointingly few. Nothing was discovered except a few shards in H1. In the narrow blocked-up passage in the north-east corner of H2 were found the half of a large pottery vessel, near the northern end of the chamber a whorl and a perforated stone, between the two stone box-like constructions on its east side part of a hollowed stone, a few feet farther north a detached socket stone and a stone whorl, and a socket stone near its original position on the east side of the entrance into the compartment on the south. About the middle were part of a saddle quern, some hammer-stones, a perforated stone, and a bone whorl. On the top of the wall adjacent to the southern entrance was a haft-plate of deer-horn with two perforations. The stone lamp (fig. 42) came from midden refuse between the built-up doorway and the wall of the tower about 2 feet below the wall-head here. Compartment H3 yielded a ring-headed bronze pin, a weaving comb, a bone like a whistle (fig. 32, No. 4), a bone pin and part of another, a whorl, and a hollowed stone, and on the wall-head to the south of the entrance a bone bead. From H4, which had been filled in, came two bone tools, and from the cellar below a small hollowed stone.

Late Cubicles outside Entrance to Tower.—On the narrow shelf of rock outside the entrance into the tower and on each side of it are the remains of several small cubicles, K. Opposite the entrance, at a distance of 3 feet 4 inches and 6 feet 9 inches from its outer end, are two sills formed of slabs, 3 feet and 3 feet 3 inches long, sunk on edge into the ground.

Aligned with the south side of the entrance are two slabs placed on end, 14 inches apart, the first set with its inner edge against the wall of the broch. The gap or doorway gives entrance into a small cubicle with built walls, the western running parallel to the other for the greater part of its length and then curving round to meet it. This cell is 6 feet in length and 2 feet 6 inches in breadth at its northern end, and has been 2 feet 6 inches in height, as shown by a roofing flag which remains in position at its inner end. To the south of this building is a solitary slab set on end and to the west of it a fallen piece of masonry. A weaving comb (fig. 26, No. 4) and a bone rubbing-tool were found on the floor.

On the north side of the entrance are two more cubicles lying concentrically with the wall of the broch. The one nearest it is 6 feet 9 inches in length, 2 feet 7 inches in breadth at the doorway and 3 feet 10 inches at the inner end, where a flag in the roof remains showing its height as 3 feet. The doorway, 1 foot 6 inches wide, is formed by two slabs set on end. The western wall is built, but the eastern wall is formed by two large slabs. A small clay pot which had collapsed under its stone lid (fig. 49) was found in the south-west corner, and a rotatory quern and a socket stone farther in. Outside, at a height of 2 feet from the ground, was a broken bronze ring, $1\frac{1}{2}$ inch in diameter.

The adjoining cubicle is 6 feet 6 inches long and 2 feet 6 inches broad at the front, widening out in two steps on the west to 5 feet 2 inches. Its portal, 2 feet wide, is formed by two slabs set on end in line with, and not across, the entrance. A boar's tusk came from this cell. Between this chamber and the edge of the rocks is the inner wall of an irregularly shaped compartment which otherwise has disappeared.

Buttressing against Outer Wall of Tower.—In describing the main building in the broch we have drawn attention to a threatened collapse of its north-western curve and to the measures taken to prevent its fall.¹ The lower gallery in the tower was blocked up for the greater part of its length with slabs packed in parallel to its sides, and it was buttressed on the outside. We have suggested that the casing wall inside the broch was also part of the preservation scheme. The buttressing was formed by jamming in slabs radially with the wall of the tower between it and the inner walls of the secondary chambers E to H. This revetment extends from near the main entrance of the tower round the north-western sector to beyond the middle of chamber H. Portions of it are shown in figs. 17 and 20. This construction blocked up the narrow pathway which gave access to the four chambers and explains why their original entrances were filled with building or secondary structures.

The new entrances to chambers E, F, and G, which would have to be constructed, would probably be on the seaward side, but as these parts have been entirely swept away nothing more can be said on this point.

In chamber H the new doorway seems to have been made near the eastern end of its south wall, just beyond the buttressing. This opening, which is 2 feet 6 inches wide, shows the lower part of the jambs rugged and does not seem coeval with the building of the wall (fig. 20).

¹ *Supra*, p. 155.

In this case the door would be reached from the south. The narrow space between the tower and the edge of the scarp of the inner trench, which was available for the approach, showed a setting of flagstones about 2 feet 9 inches higher than the foundation of the tower, indicating that this alley may have been paved.

Late Buildings to south and south-east of the Tower.—The few remaining outer buildings here are generally so dilapidated that their purpose has not been determined. Returning to the entrance, near the south end of the outer wall, there is an undeterminate piece of structure built 3 feet 9 inches outside the outer face of the wall and to the north of the doorway. On the opposite or south side are still more scanty remains of building, with a drain, 14 inches wide, retaining several of its cover-stones, and running down for 8 feet towards Steneha Geo. Within the doorway of the passage, in the angle on the south, is a triangular insertion of poor building showing three stone steps leading up towards the present wall-head.

At the extreme western or inner end of the long passage, in the narrow space between the tower and the Geo, are several short faces of walling which we could not connect up to form any definite plan. At this place the whole outer face of the wall of the tower had crashed down. A cup-marked stone is built into one of these wall sections (fig. 24), and on the floor-level near it was a hollowed stone.

At each side of the foot of the rock-hewn stair leading up into the entrance passage is a single cubicle. The one on the east has lost its outer slab, but the two end slabs, measuring 2 feet 4 inches in breadth and height, set on edge, 5 feet 4 inches apart, at right angles to the outer face of the wall, remain. The space between them has been quarried out of the rock. The cubicle on the opposite side, the west, is also rectangular and formed of slabs. It measures 3 feet 9 inches in length, 2 feet 7 inches in breadth, and 3 feet 2 inches in depth, and its cover remained in position. This box was almost full of broken pottery amongst which was a hollow stone. An irregular line of walling extends from this cubicle some 14 feet towards the Geo, terminating 7 feet from it.

At the foot of the stair half of a hammer-head of bone split longitudinally (fig. 36, No. 2) and a small Y-shaped piece of cetacean bone were found.

Some 13½ feet west of the foot of the stair are three broad steps cut in the rock, each rising about 1 foot in height. Across the highest step is a curved wall of inferior masonry, from which an erect slab projects towards the steps. Fragments of five or six crucibles of clay for melting bronze and small fragments of thin sheet bronze were found

at the base of the eastern side of the slab, and a hollowed stone basin lay on the rock in the north-east. Near the last were the fragments of



Fig. 24. Midhowe Broch : Cup-marked stone to the south of the tower.

the clay pot seen in fig. 46. In the north-west corner was a socket stone, and there were indications that there might be a doorway here in the



Fig. 25. Midhowe Broch : Cup- and ring-marked stone on the north-east wall of the tower.

west wall. Two more fragments of crucibles were got in fallen material to the east of the steps.

Cup-marked Stones.—We have just referred to the cup-marked stone built into a section of late walling. It measures $15\frac{1}{2}$ inches in length and $11\frac{1}{4}$ inches in height. There are twenty-one shallow cups impinging on each other, measuring from 2 inches to $2\frac{1}{2}$ inches in diameter (fig. 24).

Three hollowed stones, including the two illustrated in fig. 43, Nos. 1 and 2, lay separately a few feet south-west of the cup-marked stone.

Built into the foundation of the outer wall of the tower on its north-east side is another stone bearing seven or eight cup-marks and portions of three rings cut apart from the cups. The latter measure from $2\frac{1}{4}$ inches to 3 inches in diameter. The largest ring is $8\frac{1}{2}$ inches across (fig. 25). Both stones have been dressed down before being fitted into the walls. The stone measures 18 inches by $11\frac{1}{2}$ inches.

We discovered nothing to indicate how the large chambers E, F, G, and H had been roofed, neither did we see any built hearths near their centres. As there were no signs of corbelling in the present wall-heads it may be that the parts adjoining the walls had been occupied by encicles with slab walls and roofs.

RELICS.

A large number of relics were discovered and these were typical of what might be expected in a broch. As usual, bone—animal and cetacean—and deer-horn were extensively used in their manufacture. A small number of ornaments of bronze, much pottery, and a few objects of Roman workmanship were also recovered.

OBJECTS OF BONE.

Central part of a small-toothed hair-comb with only two detached teeth surviving, the two transverse binding plates decorated with two rows of dot and circle ornamentation (fig. 32, No. 1).

Ten long-handled weaving combs of cetacean bone (fig. 26): (1) with thirteen teeth, three broken, sides and base of handle concave, $4\frac{1}{8}$ inches long (fig. 26, No. 1); (2) with nine teeth, two broken, sides of handle concave and base notched, $4\frac{1}{4}$ inches long (fig. 26, No. 2); (3) has had eight teeth, three remaining, sides and base of handle concave, 4 inches long (fig. 26, No. 3); (4) with nine long teeth, sides and base of handle imperfect but originally concave, $5\frac{1}{2}$ inches long (fig. 26, No. 4); (5) with eleven teeth, sides and base of handle concave, $4\frac{1}{4}$ inches long (fig. 26, No. 5); (6) with eight teeth, one remaining, sides of handle concave, base imperfect (fig. 26, No. 6); (7) smallest of the combs, has had ten short teeth, three remaining, base of handle imperfect, on its upper face an

incised saltire (fig. 26, No. 7); (8) with eight short teeth, the point of one broken, the base of the handle swelling out to a greater width than the teeth, $3\frac{1}{2}$ inches long (fig. 26, No. 8); (9) portion only and partly



Fig. 26. Weaving Combs of Cetacean Bone.

made, with nine teeth rudely sawn out and not trimmed, base imperfect (fig. 26, No. 9); (10) portion only and unfinished, has probably had twelve teeth, partly cut out not sawn, sides of handle concave and base imperfect (fig. 26, No. 10).

Seven rounded chisel-ended implements made from metatarsal and metacarpal bones of sheep, the distal ends being sliced away on one side: (1) $4\frac{3}{8}$ inches long (fig. 27, No. 1); (2) $4\frac{1}{8}$ inches long, epiphysis wanting (fig. 27, No. 2); (3) $4\frac{1}{8}$ inches long, the proximal end partly pared off (fig. 27, No. 3); (4) $4\frac{1}{8}$ inches long, imperfect at proximal end (fig. 27, No. 4); (5) $3\frac{9}{8}$ inches long, the proximal end dressed to rectangular section (fig. 27, No. 5); (6) $4\frac{3}{8}$ inches long (fig. 27, No. 6);



Fig. 27. Chisel-ended Implements of Bone.

(7) $4\frac{1}{2}$ inches long (fig. 27, No. 7). Sometimes the ends are sliced at right angles to the axis of the joint and sometimes parallel to it.

Two fine-pointed awls or borers formed from the ulnæ of sheep, $4\frac{1}{2}$ inches and $4\frac{1}{2}$ inches long (fig. 28, Nos. 9 and 10).

Borer formed from a splintered leg bone of a sheep, $3\frac{1}{2}$ inches long (fig. 28, No. 6).

Five pins or borers, 4 inches, $3\frac{3}{4}$ inches, $3\frac{9}{8}$ inches, $3\frac{1}{4}$ inches, and $2\frac{1}{4}$ inches long, the last two imperfect: four shown in fig. 28, Nos. 1, 3, 4, and 5.

Pin or borer made from the leg bone of a bird, $2\frac{1}{4}$ inches long (fig. 28, No. 2).

Part of a bone pin, finely made, $1\frac{1}{2}$ inch remaining.

Stout bone borer, 5 inches long (fig. 29, No. 1).

Bone borer, imperfect at butt end, $4\frac{1}{2}$ inches long (fig. 29, No. 2).

Two borers formed from splinters of leg bones, $3\frac{1}{2}$ inches and $2\frac{3}{8}$ inches long (fig. 28, Nos. 7 and 8).

Large splinter of the leg bone of an ox, its blunt point made smooth by rubbing, $5\frac{1}{2}$ inches long (fig. 30).



Fig. 28. Pins and Borers of Bone.

Small irregularly shaped splinter of bone, highly polished all over, $1\frac{1}{2}$ inch long.

Eight splinters of bone, several of spatulate form, ranging from $2\frac{1}{2}$ inches to $4\frac{1}{2}$ inches in length, much polished (fig. 31).

Part of the leg bone of an ox, split longitudinally, the proximal end rounded by rubbing, $4\frac{1}{2}$ inches long.

Two spatulate objects formed from the scapulae of small animals, possibly sheep, $2\frac{1}{2}$ inches and $1\frac{1}{2}$ inch long (fig. 32, Nos. 5 and 6).

Three splinters of leg bones of ox showing slight signs of use.

Tube formed from the middle portion of the ulna of a large bird, such as the Wild Goose or Fish Eagle, measuring $6\frac{1}{2}$ inches long and $\frac{1}{2}$ inch in diameter (fig. 20, No. 3).



Fig. 20. Bone Implement.

Fig. 20. Borers and Tube of Bone.

Vertebra of a small animal, the ends rubbed down, $\frac{3}{4}$ inch long.

Bead or whorl of cetacean bone of flattened spheroidal shape, chipped round the circumference and gnawed in places by a rodent, $1\frac{1}{4}$ inch in diameter and $\frac{1}{2}$ inch thick (fig. 32, No. 2).

Half of the head of a pin of tooth or morse ivory, 1 inch in diameter, with a large longitudinal perforation and a vertical one for the iron stem.



Fig. 31. Spatulate Bone Objects.

Three beads or whorls made from the proximal ends of femurs, the perforations in two being very small (fig. 40, No. 6).

Proximal end of an ox femur with a perforation begun from the under side.

Proximal end of an ox femur, roughly dressed to a bobbin-like shape.

Many animal bones as described in Miss Platt's report.

Large block of whale's bone, $12\frac{1}{2}$ inches long, $8\frac{1}{2}$ inches broad, and $5\frac{1}{2}$ inches thick, with an oblong and a rounded cavity on the top (fig. 33). Found outside the southern wall of the broch, 9 inches above the rock.

Large piece of cetacean bone, roughly squared at one end, $9\frac{1}{2}$ inches long by $1\frac{1}{4}$ inch by $1\frac{1}{8}$ inch at the broad end.

Plate of cetacean bone with five perforations, two at one end and



Fig. 32. Miscellaneous Objects of Bone. (1.)

three at the other, $9\frac{1}{2}$ inches long, $2\frac{1}{2}$ inches broad, and $\frac{1}{2}$ inch thick (fig. 34).

Y-shaped piece of cetacean bone, imperfect, $3\frac{1}{2}$ inches long.

Oval ring of cetacean bone, $1\frac{1}{8}$ inch and $\frac{1}{4}$ inch in cross-diameters and $\frac{1}{8}$ inch thick (fig. 32, No. 3).

Fragment of a plate of cetacean bone, $4\frac{1}{2}$ inches long and $\frac{3}{8}$ inch thick, showing part of the end and one side of a large rectangular longitudinal slot cut in it.

Hollowed piece of cetacean bone of semicircular section, $7\frac{1}{2}$ inches in length.

Small vertical section of a cup formed from a whale's vertebra, $5\frac{1}{2}$ inches high.



Fig. 33. Object of Whale's Bone.

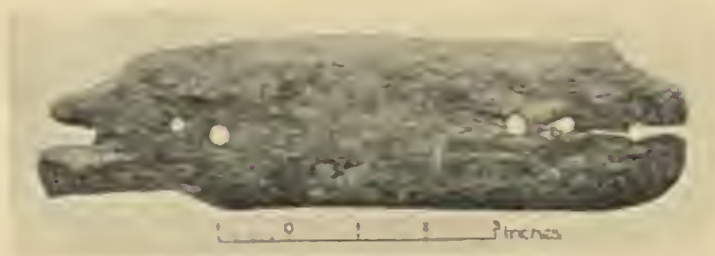


Fig. 34. Perforated Plate of Whale's Bone.

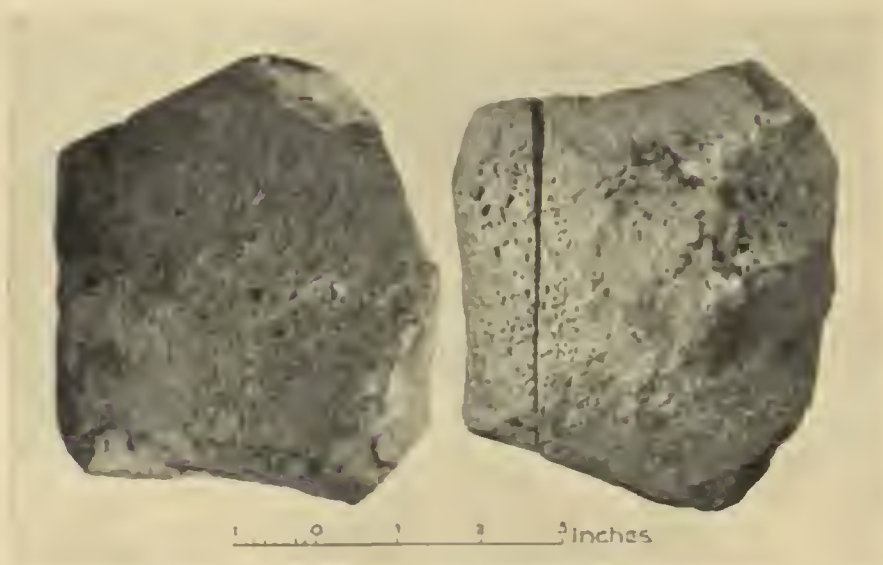


Fig. 35. Worked piece of Cetacean Bone.

Small edge fragment of the dorsal plate of a whale.

Two very dense and hard pieces of the paddle bone of a very large whale, 5 inches by $4\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, and 3 inches by $3\frac{1}{4}$ inches by $2\frac{1}{2}$ inches, the latter rubbed flat in parts at one side. The first is illustrated in fig. 35, which shows a saw-cut made for examination purposes.

Eighteen boars' tusks, one measuring $7\frac{1}{4}$ inches in length.

Oyster-shells, one 5 inches in diameter, and many limpets.

OBJECTS OF DEER-HORN.

Hammer-head $2\frac{3}{4}$ inches long, $1\frac{1}{8}$ inch and $\frac{1}{8}$ inch in cross-diameters, the perforation $\frac{3}{8}$ inch in diameter with a small pin-hole bored lengthwise from end to end in the centre (fig. 36, No. 1).



Fig. 36. Hammer-heads of Deer-horn. (1.)

Half of a hammer-head split longitudinally, $2\frac{1}{8}$ inches long and $1\frac{1}{8}$ inch broad, the perforation $\frac{1}{2}$ inch in diameter (fig. 36, No. 2).

Thin flat plate slightly curved, $6\frac{3}{8}$ inches long and 1 inch in greatest breadth, with a pin-hole nearest the broadest end retaining its pin of bone, $\frac{1}{4}$ inch in diameter, and half of another perforation on the edge near the other end, $\frac{3}{8}$ inch in diameter, the outer surface covered with oblique scores (fig. 37).

Tine split longitudinally with two large perforations near the broad end, $6\frac{3}{8}$ inches long, probably part of a handle of some instrument (fig. 37).

Tine with a slot cut in the broad end and highly polished at the point, 10 inches long, doubtless the handle of some implement (fig. 37).



Fig. 37. Handles and Hafts of Deer-horn.

Haft-plate with two pin-holes in it, imperfect, $5\frac{1}{2}$ inches long (fig. 37).

Thin oblong plate $2\frac{1}{2}$ inches long, $\frac{1}{2}$ inch broad, with two perforations. Haft, the socket imperfect, $4\frac{1}{2}$ inches long (fig. 37).

Haft formed from a section of the beam of a very stout antler

7½ inches long, with a socket at the thick end 4 inches deep, and a large pin-hole on opposite sides near the mouth of the socket.

Nine deer-horn picks, the bay tine being cut off the antler in each case, the largest measuring 9½ inches along the beam which serves as the handle; the brow tine is 8 inches in length. The end of the handle has been scooped out to form a socket 3½ inches deep. Most of them are imperfect. Two are illustrated in fig. 38.

Nine points of deer-horn tines from 4½ inches to 9 inches in length, many worn at the point or showing marks of cutting or sawing.



Fig. 38. Deer-horn Picks. (1.)

Point of a tine, 1½ inches long, carefully sawn off.

Four segments of tines cut at both ends.

Two segments of the beam of very stout antlers cut at the ends, 4½ inches and 7½ inches long.

Segment of an antler, 3½ inches long, cut across the ends and pared down on the under side to a D-shaped section.

Section of the beam of an antler, perforated and roughly dressed by cutting.

Part of the beam of an antler, 7 inches long, pared down at an acute angle to a chisel-shaped end, at least ten cuts of the iron tool having been required, the longest of which has penetrated ½ inch.

An antler, 22 inches long, with five tines.

Part of the skull of a red-deer with part of one antler attached; the beam has been partly sawn and then broken $4\frac{1}{4}$ inches from the burr, and the bay tine has been cut and then broken off. The second antler has been cut and broken off below the burr (fig. 39).

Fragments of six more antlers.

Burr and brow tine of a large antler, the beam of which has been



Fig. 39. Part of Skull and Antler of Deer-horn.

sawn off and the core hollowed out, the tine and the base of the burr showing cuts.

Curved object, 3 inches in length, 1 inch by $\frac{1}{4}$ inch in cross-diameters, pierced lengthwise with a large perforation, and transversely with two holes $1\frac{1}{4}$ inch from one end, possibly a whistle (fig. 32, No. 4).

STONE OBJECTS.

Part of a shale or jet armlet, the section being flat on the inside and double curved on the exterior, $1\frac{3}{4}$ inch long.

Five whorls of flattened spheroidal shape, ranging from $1\frac{3}{4}$ inch to $1\frac{1}{4}$ inch in diameter, and half of another (fig. 40, Nos. 1 to 5).

Four whorls of irregular shape, the largest $1\frac{3}{4}$ inch in greatest diameter.

Perforated stone of flat, sub-oval shape, 3 inches long and $2\frac{1}{2}$ inches broad, the hole drilled straight through the centre (fig. 40, No. 7).

Perforated stone of irregular shape, $4\frac{1}{4}$ inches by $3\frac{1}{4}$ inches by $1\frac{1}{4}$ inch.

Round flat pebble partially perforated from both sides, but the holes not opposite, $1\frac{1}{4}$ inch in diameter.

Polisher or whetstone of pinkish quartzite, oval in shape and rubbed flat on one face, $2\frac{3}{4}$ inches by $1\frac{1}{2}$ inch by $1\frac{1}{2}$ inch.

Pebble, highly polished on one face, $1\frac{5}{8}$ inch by $1\frac{1}{2}$ inch by $\frac{1}{4}$ inch.

Whetstone, chipped along one edge and at the ends, $4\frac{1}{4}$ inches by $1\frac{1}{2}$ inch by $\frac{1}{2}$ inch (fig. 41, No. 1).

Four whetstones formed from irregularly shaped water rolled stones, measuring $5\frac{1}{2}$ inches, $5\frac{1}{4}$ inches, $4\frac{1}{4}$ inches, and $4\frac{1}{2}$ inches in length.

Whetstone, oblong and of rectangular section, worn on two faces

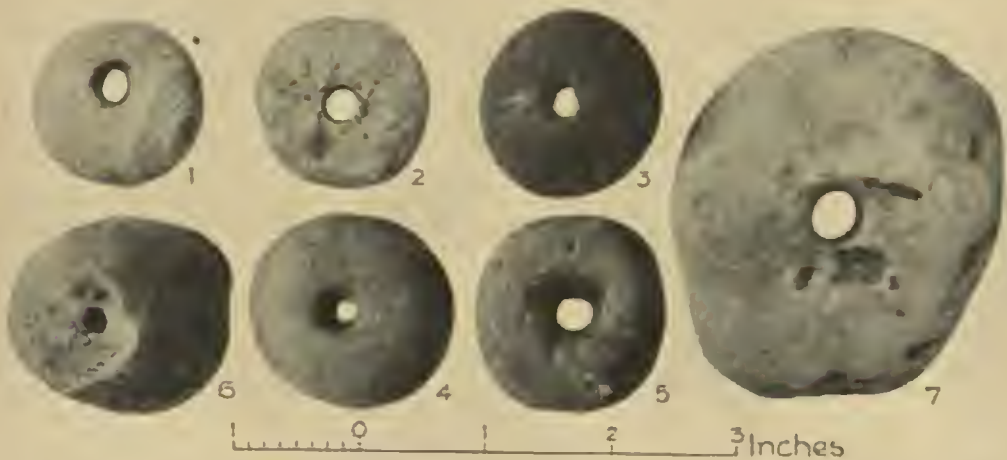


Fig. 40. Whorls and Perforated Objects of Stone and Bone.

and rubbed down at the ends, 5 inches long, $1\frac{1}{2}$ inch broad, and 1 inch thick (fig. 41, No. 5).

Two well formed whetstones of fine micaceous sandstone, $4\frac{1}{4}$ inches long, $1\frac{3}{4}$ inch broad, and $\frac{1}{4}$ inch thick and 3 inches long, $\frac{5}{8}$ inch broad, and $\frac{1}{4}$ inch thick (fig. 41, Nos. 2 and 3).

Whetstone, $3\frac{1}{4}$ inches long, $\frac{1}{2}$ inch broad, and $\frac{1}{2}$ inch thick (fig. 41, No. 4).

Two broken whetstones.

Implement of sub-oval shape, rubbed smooth at one end and along one edge, $3\frac{5}{8}$ inches long, $1\frac{1}{2}$ inch long, and $\frac{5}{16}$ inch thick.

Oval water rolled stone encircled lengthwise with a groove, possibly a sink stone, $3\frac{1}{2}$ inches long, 2 inches broad, and 2 inches thick.

Pendant or sinker, formed of a naturally broken stone with large

perforation at the narrow end, $3\frac{1}{8}$ inches long, and $1\frac{3}{8}$ inch by $1\frac{1}{4}$ inch at broad end.

Long, thin water-worn stone, the ends roughly broken off, $6\frac{1}{2}$ inches long.

Pot-lids of stone, all nearly circular, the smallest measuring $2\frac{1}{2}$ inches in diameter and $\frac{5}{16}$ inch in thickness, and the largest $13\frac{1}{2}$ inches by 1 inch. One measuring $5\frac{1}{2}$ inches in greatest diameter and $\frac{5}{16}$ inch in thickness was found beside the small pot illustrated in fig. 40.



Fig. 41. Whetstones.

Hollowed stone of flattened spheroidal shape with a projection on one side, like a stone cup in the making, $5\frac{1}{2}$ inches in diameter and 3 inches in height.

Hollowed stone of sub-oval shape, possibly a lamp, $5\frac{7}{16}$ inches long, $4\frac{9}{16}$ inches broad, and $2\frac{1}{4}$ inches high.

Hollowed stone of triangular shape, probably a lamp, measuring about 5 inches long on each side and $3\frac{1}{8}$ inches high, thickly encrusted with soot outside the brim (fig. 42).

Twelve hollowed stones or mortars generally made from boulders, the largest measuring $22\frac{1}{2}$ inches by $19\frac{1}{2}$ inches by $11\frac{1}{2}$ inches (fig. 43), Nos. 1 and 2.



Fig. 42. Hollowed Stone, probably a Lamp.



Fig. 43. Mortars (1, 2, and 4), Saddle Querns (5 and 6), and Socket Stone (3).

Twelve saddle querns, the largest which is broken being now $17\frac{1}{2}$ inches long and 12 inches broad.

Six upper stones of rotatory querns mostly broken.

Two lower stones of rotatory querns. In no case were the upper and lower stones of a quern found together.

Half of a perforated stone like the upper stone of a small rotatory quern $6\frac{1}{2}$ inches in diameter.

Twenty-three socket stones.

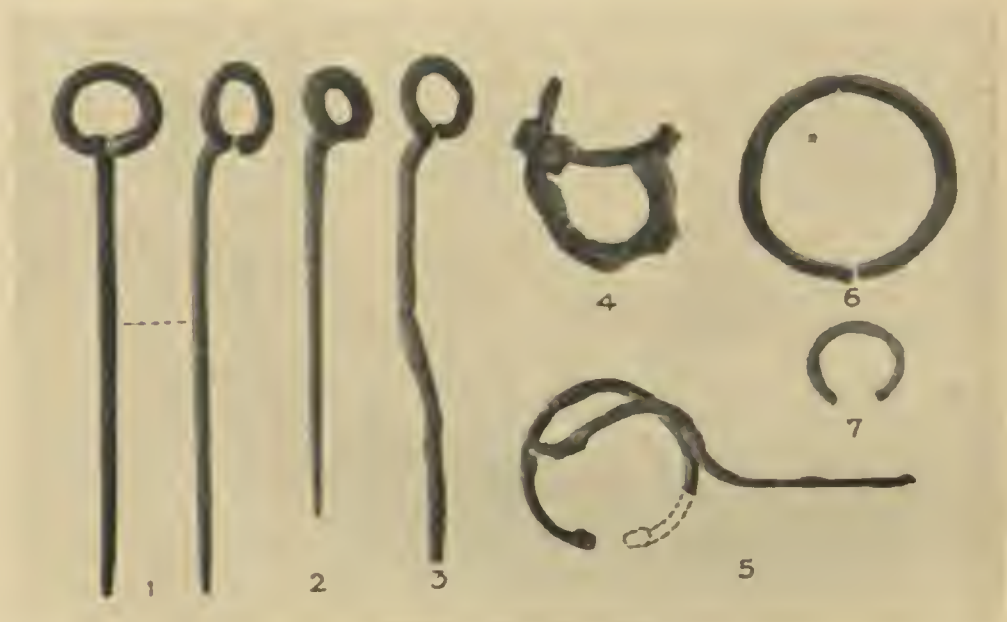


Fig. 44. Pins, Brooches, and Rings of Bronze. (I.)

Nearly one hundred hammer-stones or pounders invariably made of water-worn pebbles, the two smallest measuring $1\frac{1}{2}$ inch and $2\frac{1}{8}$ inches in length, and the largest 9 inches by $6\frac{1}{2}$ inches by $4\frac{1}{2}$ inches.

A well-made scraper of yellow flint $1\frac{1}{8}$ inch by $1\frac{1}{8}$ inch in cross-diameters.

METAL OBJECTS.

Three bronze pins with circular ring heads projected forward from the stem, $2\frac{1}{8}$ inches, $2\frac{1}{2}$ inches, and $2\frac{1}{4}$ inches in length (fig. 44, Nos. 1 to 3).

Stem of bronze pin $1\frac{1}{8}$ inch long.

Penannular ring brooch of bronze with large terminals cupped at the ends, $1\frac{1}{8}$ inch and 1 inch in cross-diameters. The pin, which has a

looped hinge, a very high bow and a long flattened point, measures 3 inches in length (fig. 45).

Small penannular ring brooch of bronze, broken into small fragments, with a bow-shaped pin, probably with spheroidal terminals, and about 1 inch in diameter (fig. 44, No. 4).

Greater part of a penannular ring brooch of thin bronze wire showing the surviving terminal turned back on the wire. It seems to have been at least 1 inch in diameter; and piece of bronze wire bent into bow shape and flattened near one end, $1\frac{5}{16}$ inch long, which has probably formed the pin of the brooch (fig. 44, No. 5).

Ring of bronze, broken, $1\frac{1}{2}$ inch in diameter; as it is hollow it must have been made by lapping over a thin plate of metal (fig. 44, No. 6).



Fig. 45. Bronze Brooch. (J.)

Ring of bronze with a break in it, flattened on one side, measuring $\frac{7}{16}$ inch in greatest diameter (fig. 44, No. 7).

Fragments of a Roman patera of bronze which has measured $5\frac{1}{2}$ inches in external diameter at the lip, the bowl smashed to atoms, but the greater part of the handle surviving, one part at the rim having been patched.

Some small flakes of sheet bronze found beside the crucibles.

Two pieces of polished hematite, $2\frac{1}{2}$ inches by $2\frac{1}{2}$ inches by $1\frac{1}{4}$ inch, and $1\frac{1}{8}$ inch by 1 inch by $\frac{1}{16}$ inch.

A large quantity of iron slag found at the furnace in chamber G.

POTTERY.

All the pottery with the exception of a few very small pieces of unornamented Samian and dark coloured Roman ware is hand-made, and consists of:—

A pot of reddish clay, of sub-oval shape, with a short everted rim, measuring $11\frac{1}{2}$ inches in height, $7\frac{1}{2}$ inches in diameter at the mouth,

10 inches at the bulge, and $5\frac{1}{2}$ inches across the base. At the rim, which is flat on the top, the wall is only $\frac{1}{8}$ inch thick. The vessel is unornamented and has been restored (fig. 46).

More than half of an unornamented pot of very coarse reddish clay containing much crushed stone, some pieces of which are over $\frac{1}{4}$ inch in length. It is bucket-shaped and curves in slightly towards the rim.



0 1 2 3 Inches.

Fig. 46. Clay Pot.

It is $11\frac{1}{2}$ inches in height, 9 inches in diameter at the mouth, $9\frac{1}{2}$ inches at the widest part, and 6 inches across the base. The lip is flattened on the top and the wall is $\frac{3}{8}$ inch thick. The pot has been restored (fig. 47). Found beside the smelting hearth.

Unornamented pot of very dark clay with a short everted rim, swelling out in a flat curve to the shoulder and curving in to a relatively narrow bottom. It is $8\frac{1}{2}$ inches in height, $6\frac{1}{2}$ inches in diameter across the mouth, $6\frac{1}{2}$ inches at the neck, $10\frac{1}{2}$ inches at the bulge, and $3\frac{1}{2}$ inches across the base. The top of the lip is rounded and measures $\frac{1}{4}$ inch in thickness. It has been restored (fig. 48).

Pot of very dark coloured clay, unornamented, with a slight shoulder and a short, slightly everted lip, measuring 5 inches in height, $4\frac{1}{2}$ inches in diameter across the mouth, $5\frac{1}{2}$ inches at the shoulder, and 4 inches across the base. The rim is rounded on the top and measures $\frac{5}{16}$ inch in thickness. It has been restored. Lying amongst the fragments of the pot was a stone pot-lid (fig. 49).



Fig. 47. Clay Pot.

Slightly less than half of the wall of a pot of dark clay, buff-coloured on the outside and inside, of sub-oval shape with a short everted rim. It measures over $9\frac{1}{2}$ inches in height. The lip, $\frac{1}{4}$ inch thick, is rounded on the top and at the most the wall is $\frac{1}{16}$ inch thick. The outer surface and the upper part of the inner is striated as if finished off by rubbing with grass.

Large quantities of shards of pottery, very few of which could be fitted together, were recovered. It was generally of dark colour in the inside and buff to red on the outside. Some pieces are black all through and some are red. Fragments of more than twenty rims and



Fig. 48. Clay Pot.



Fig. 49. Clay Pot and its Stone Pot-lid.

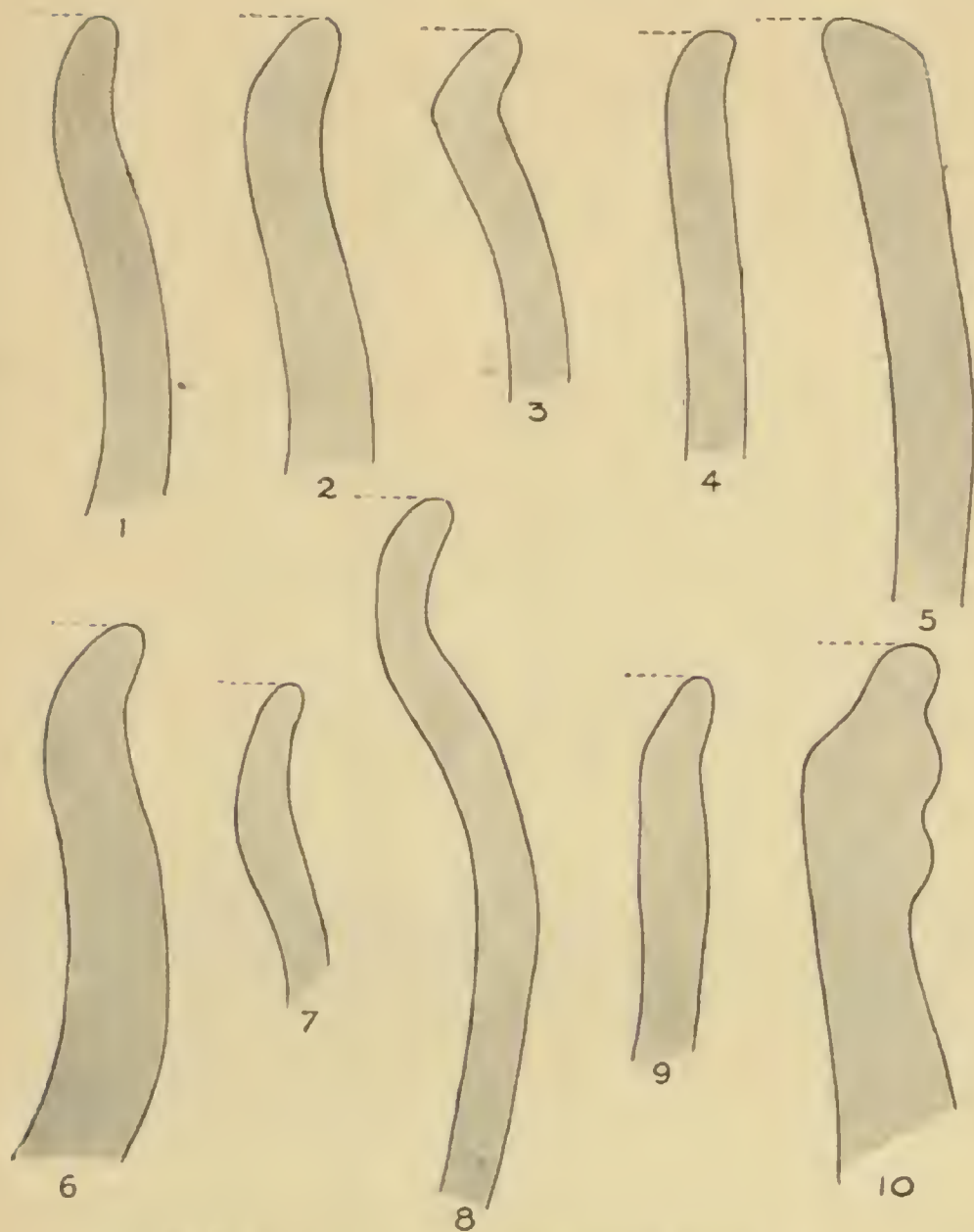


Fig. 50. Sections of Pottery from different parts of the Broch. (f.)

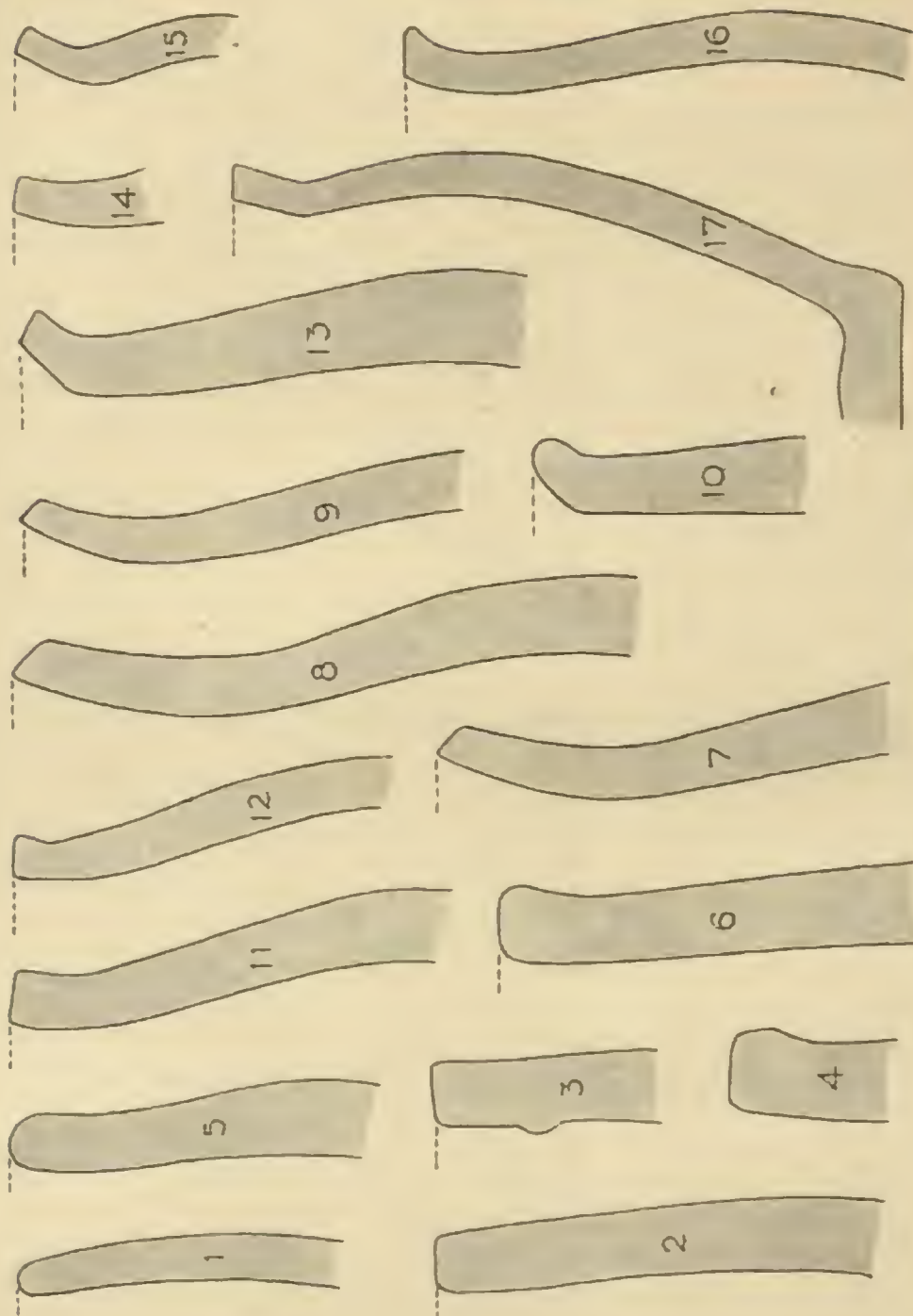


Fig. 51. Sections of Pottery found in the Cubicle. (1.)



Fig. 52. Clay Pots.



Fig. 53. Clay Mould and Plaster Cast made therein. (†.)

as many bases, measuring from $2\frac{3}{4}$ inches to 6 inches in diameter, were identified. The great majority of the vessels had had slightly everted short rims. Only one ornamentally shaped piece was secured, and it consisted of a rim portion, $3\frac{1}{2}$ inches long and $2\frac{1}{2}$ inches high, of a vessel of hard dark clay with a reddish tinge. The rim had been vertical and was encircled with three rounded mouldings outside and a concavity on the inner side of the lip. Several pieces showed traces of wiping on the exterior similar to that referred to on the large section of one of the vessels previously described. Figs. 50 and 51 give a good idea of the forms of the rims and the thickness of the ware.

The shards found in the enbleie weighed $37\frac{1}{2}$ pounds, but very few pieces could be fitted together. It was possible to restore only portions of two small vessels of dark ware (fig. 52, Nos. 1 and 2).



Fig. 54. Hollow Object of Clay. (1.)

One showed a complete section of the wall and base. It measured $3\frac{1}{2}$ inches in height and $2\frac{3}{8}$ inches across the base. In fig. 51 is seen a selection of the sections of the rims of the vessels.

Fragments of seven or eight small crucibles of hard well-baked clay for casting bronze.

Part of one valve of a mould measuring $2\frac{1}{2}$ inches by $1\frac{1}{2}$ inch by $1\frac{1}{2}$ inch, for casting a slightly curved

cylindrical object showing two raised transverse mouldings near the centre (fig. 53).

Half of a flat hollow object, 2 inches in diameter and $\frac{1}{8}$ inch in thickness, with oblique incisions round the edge on the upper side (fig. 54).

The fragment of the small-toothed hair-comb, with teeth on both sides, represents a class of relic which has often been found in brochs. There are thirty-seven of them in the National Museum, most of which came from brochs in Orkney and Caithness, but a few were found in earth-houses in the latter county and the Outer Hebrides. All those which came from brochs had their component plates clasped by rivets of iron, in a few of the others they were made of bronze.

The ten weaving combs were made of cetacean bone, the favourite material for making these implements among the broch builders and the occupants of the Hebridean earth-houses. Only one bears ornamentation, and that consists of a simple incised saltire (fig. 26, No. 7). The two unfinished specimens are of special interest, as they exhibit two

methods of cutting out the teeth. In one (fig. 26, No. 10) they are only partly cut, this having been done with a pointed knife or other instrument; in the other (fig. 26, No. 9) they have been sawn, but with a saw which must have been fairly thin and not very deep, as the cuts do not follow a straight line. This is surprising when we consider the small-toothed combs in which the teeth have been sawn by very thin tools that have kept straight and true. These saws probably were deeper. In the Museum there are eighty-three weaving combs of bone mostly cetacean and a few of deer-horn, more or less complete. The ten from Midhowe and one from the adjacent broch at Broch bring the number recorded from Scotland up to ninety-four. Forty-nine were found in Orkney, seven in Shetland, thirteen in Caithness, all in brochs; four in a cave in the Stewartry of Kirkcudbright; twelve from earth-houses in the Outer Hebrides; six from two Roman forts; one from a hut-circle in Perthshire; one from a rock-shelter in Argyll; and one with no locality.

Associated with the weaving comb in the manufacture of fabrics is the spinning whorl, but only ten of stone, three of bone, and half of one of clay were found. This seems a small number compared with that of the combs. But the same thing is to be seen elsewhere. The broch of Burrian in Orkney gave eighteen combs and thirty-nine whorls, and the earth-house at Bae Mhic Connain, in North Uist, yielded four combs and only a partially made whorl. A possible explanation of these discrepancies may be that much of the spinning would be done in the open air by girls and others while tending their flocks and herds, and many of the whorls would be lost. The Midhowe whorls are generally poor specimens, most being simply of flattened spheroidal form and only two ornamented.

The occurrence of seven implements formed from metatarsal and metacarpal bones of sheep, of rounded chisel shape at the distal end, is unusual, although a considerable number of such bones tapering to a sharp point have been found in Scottish earth-houses and brochs. There are only six with chisel-like ends in the Museum; two came from brochs, one in Orkney and one in Shetland; one from a cave in Ayrshire; one from a crannog in Wigtownshire; one from an earth-house in Orkney; and one from an occupied site on a rocky islet in the Firth of Forth. Five of those from Midhowe and the same number of the others were sharpened in the same plane as the axis of the proximal joint of the bone; but one from Midhowe and the one from the other Orkney broch were cut at right angles to the axis of the joint. The purpose of these implements has not been explained.

There was nothing of special importance in the stone objects

discovered. Relics such as whetstones, whorls, saddle and rotatory querns, pot-lids, lamps, and mortars may be expected in any broch. But the number of socket stones, twenty-three, of which six remained in their original positions, is unusually great.

Although the presence of six or eight small crucibles and part of a mould of clay showed undoubtedly that the manufacture of ornaments of bronze was one of the crafts plied here, only nine objects of this metal were found. We have a parallel to this in the earth-house¹ at Bac Mhic Connain, North Uist, which, although it contained a furnace for melting bronze and yielded crucibles and moulds, it produced only one bronze object, a very fine pin.

One of the bronze penannular brooches from Midhowe has an unusually long pin and relatively large cup-shaped terminals in the ring; another of slight make has also a long pin and the ends of the ring turned back on it, a primitive type.

The three pins with unornamented projecting ring-heads display a feature that we have never before seen referred to. It seems to have been taken for granted that such objects found previously had been cast; but there is a break in the ring where it rejoins the top of the stem, which shows that the straight wire of which this class was made had simply been bent into form. An examination of other pins of this class in the National Museum shows that they were made in a similar way, though this does not seem to have been noted.

The mould, of which only part was recovered, must have produced a fairly stout casting, quite different from the small personal ornaments which we are accustomed occasionally to find in brochs. We have not been able to determine what the object was meant for.

From the large quantity of iron slag which were found on and around the smelting hearth, it follows that the broch people were quite accustomed to the manufacture and use of iron. But not a single weapon or tool of this metal was discovered. One can hardly imagine that the rock-cut cellars or wells of considerable depth, in this and other Orkney brochs, could have been quarried out without iron implements or tools, and although we have shown that wooden wedges could have been used to detach slabs on the sea-shore (fig. 55 shows one skinned area) it is quite possible that iron ones were used.

The presence of whetstones shows that, at least, knives if not larger cutting or thrusting weapons, which required to be sharpened, were part of the equipment of the broch people. These would probably be made of

¹ Our Scottish earth houses were contemporary with the brochs, so in discussing the relics found in the one class of structure continual reference must be made to those found in the other.

iron and not of bronze, as the latter would not disappear through natural agencies like the former. Besides we have no evidence that bronze was used for such implements in any of our brochs and earth-houses. That good strong cutting metal tools were in use at Midhowe is evident, because one of the antlers found showed a cut $\frac{1}{8}$ inch deep on the slant.

The question arises: What has become of these tools? They could not all have been carried away, and our only suggestion is that those that happened to be left must have disintegrated completely. The process of decay would be accelerated in Midhowe, as in other brochs



Fig. 55. Midhowe Broch: View from the Broch towards the Atlantic, showing rocks skinned of slabs.

and earth-houses on the shore, by being drenched from time to time by sea-water in the form of spray, during the centuries that have passed since the buildings were abandoned.

Fragments of pottery were found in great numbers in many parts of the broch, and it has been found possible to restore completely three vessels, and partially three more. This constitutes the finest collection of clay pots recovered so far from a broch. These are bucket-shaped or shouldered, and bear a resemblance to some of the vessels found at All Cannings Cross, in Wiltshire.¹

The cache of shards found in the stone box is an unique discovery for Scotland. The cubicle lay only 16 feet away from the edge of

¹ Mrs Cunningham, *All Cannings Cross*, pls. 38, 2; and 42.

the Geo, but, as the pieces of pottery were deliberately collected and retained and not thrown into the water, there must have been some reason for this. The only explanation we can put forward is that these fragments had been preserved for the purpose of being ground down and mixed with fresh supplies of clay when a new batch of pottery was being made. There were $3\frac{1}{2}$ lbs. of fragments of rims, 7 lbs. of bases, and 27 lbs. of walls— $37\frac{1}{2}$ lbs. in all.

In mixing the clay, as a rule, the potters seem to have been satisfied with the natural mixture of small stones which it contained. Generally there does not appear to have been any crushed stone added to it, as is seen in cinerary urns of the Bronze Age.

It is remarkable that there was practically no ornamentation on the vessels; only one or two small pieces showed an attempt at decoration, and this consisted of simple incised lines.

That the Midhowe folk, like those in some other brochs, were in contact with Roman civilisation is seen in the few shards of Samian and dark-coloured ware and the broken bronze patella.

The occurrence of two cup-marked stones built into the broch is important, as rock sculpturings in the form of cups and rings or spirals are very rare in Orkney. Rings detached from cups, as in one of our stones, are not commonly met with in Scotland, though such markings have been recorded from Kilmartin, Argyll; Knappers, Kilbowie, Dumbartonshire; and Kinneff, Kincardineshire.

Periods of Occupation.—Two distinct major reconstructions have been detected in the buildings of the broch, but we cannot say definitely that the secondary constructions within the tower can be correlated with those outside it, although we offer some suggestions.

Originally the broch consisted of the central tower and the strong outer wall with its outer and inner ditches, the main entrance being possibly located at the north-western end of the wall.

The second period is indicated by the outer chambers E, F, G, and H, which belong to a later time. This is seen clearly in chamber H, as part of the inner face of the outer wall of the broch has been removed to a depth of at least 5 feet in places to make room for the north side of the chamber, and the bottom of the inner ditch has been filled in to level up the floor. At the place where this was tested, just within the south wall of the chamber, a depth of 2 feet 6 inches had been made up. The character of the building in the four chambers, which have common separating walls, is good and homogeneous, though different from that in the broch proper.

The carving in of the north-west segment of the tower must have occurred after these chambers were built, because the buttressing

erected on the outside of its wall to support it, is inserted between it and the south and south-east walls of the chambers, blocking up the entrances into them. This may be taken as the third period, and it is possible that, at this time or a little later, the sub-division of chamber H and the covering up of the cellar in its floor, the erection of cubicles outside the entrance to the tower, in the south-west corner of chamber H, and at the back of chamber G, were carried out. The masonry in these is much inferior to that shown in the earlier structures.

We have not been able to link up with any one of the three periods, though they are doubtless later than the first, the fragments of buildings within and without the entrance through the south end of the outer wall, nor of those lying outside the south arc of the tower. Neither have we been able to date the two sections of very poor walling that have been thrown across the south end of the inner ditch. As for the paving in the northern part of the outer trench it was laid down subsequent to the outer wall being built, because for the greater part of its length the flags are laid against the wall 1 foot above the foundation.

So much for the out-buildings. If we are right in assuming that the casing wall and alcove erected against the inside of the north-west part of the tower were built when the buttressing was constructed on the outside and the lower gallery in the wall of the broch blocked up, then the casing wall and alcove belong to the third period. Judging from the cavities cut out to receive the ends of the suggested lintel over the door into chamber C, it seems quite probable that the erection of the wall of upright slabs dividing the inner court of the tower into two compartments was carried out when the casing wall was built, and so this divisional wall would belong to the same time.

The insertion of the upper mural cell in the east side of the tower, which closed up the higher gallery, and the erection of the stair leading up to it within the inner court, may also have taken place during this period.

Presumably the lower hearths in compartments C and D belong to the time when the divisional wall between them was set up, and the hearths superimposed on them must be later.

The rectangular structures formed of slabs set on edge in the floors recall those of similar shape discovered in the earth-houses at Skara Brae in the adjoining island.

The time taken to excavate the broch lasted for five consecutive summers and a few winter months, and practically the whole work of clearing out the structures was done by Mr James K. Yorston. It has been computed that he wheeled out from fifteen hundred to two thousand tons of fallen stones and debris. We should like to express

our great appreciation of the careful way in which he carried out the work. We are also indebted to Professor Low, Miss Platt, Professor Ritchie, and Dr Calman for their reports on the bones submitted to them.¹

REPORT ON HUMAN BONES. By Professor ALEX. LOW, M.D.,
F.S.A.Scot., University of Aberdeen.

The bones received consist of a human frontal bone with fragments of a lower jaw. The frontal bone is almost complete, the sutures connecting it with adjacent bones have been open, thus allowing of easy separation. The bone is smooth and delicate, with the forehead vertical, frontal eminences prominent, the glabella and superciliary arches slight, and the supra-orbital margins finely cut—characters indicating the skull of a female. The attached nasal bones are narrow, straight, and projecting, such as is seen in a Nordic type of skull.

Though the bone has belonged to a young individual the crowns of the molar teeth, present in the fragmentary lower jaw, are much worn so that the dentine is exposed.

REPORT ON ANIMAL AND OTHER BONES. By MARGERY I. PLATT,
M.Sc., Royal Scottish Museum, Edinburgh.

The bones examined included:—

Horse, ox, pig, sheep, red and roe deer, two jaws of wolf or dog, wild cat, common fox, Orkney vole, two humeri and part of tibia(?) of seal, and left lower jaw of grey seal.

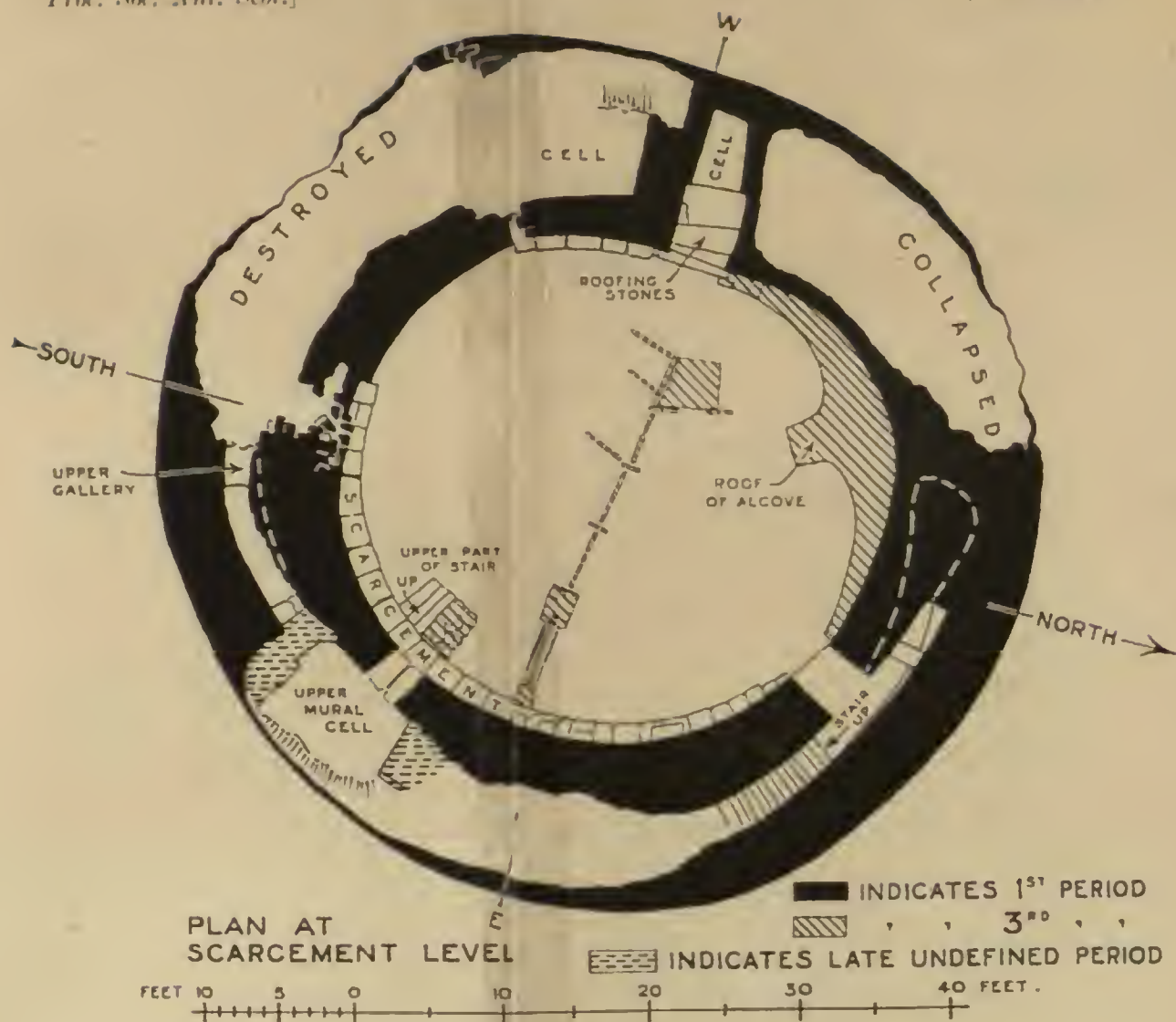
Goose, duck, common fowl, gannet, shag, heron, and mandible of a bird similar to oyster-catcher.

A small fragment of a fish jaw.

Ox, *Bos frontosus*.—Regarded as a whole the Midhowe skull gives the general impression of belonging to a small-sized ox of extremely sturdy build. In spite of its smallness the bones agree in thickness with those of a Urns skull. The shape of the skull is more nearly reminiscent of that of *Bos frontosus*, Nilsson, a fossil ox of Scandinavia, than that of any other type (fig. 56).² Of course there is a discrepancy in size; that of *Bos frontosus*, judging by a cast to be seen in the British Museum

¹ Mr Grant has handed over the broch to H.M. Office of Works, who are now carrying out the work necessary for its preservation.—J. G. C.

² "Notes on the Skull of an Ancient Ox from Rousay, Orkney." M. I. Platt in *Scottish Antiquarist*, 1933, p. 17.



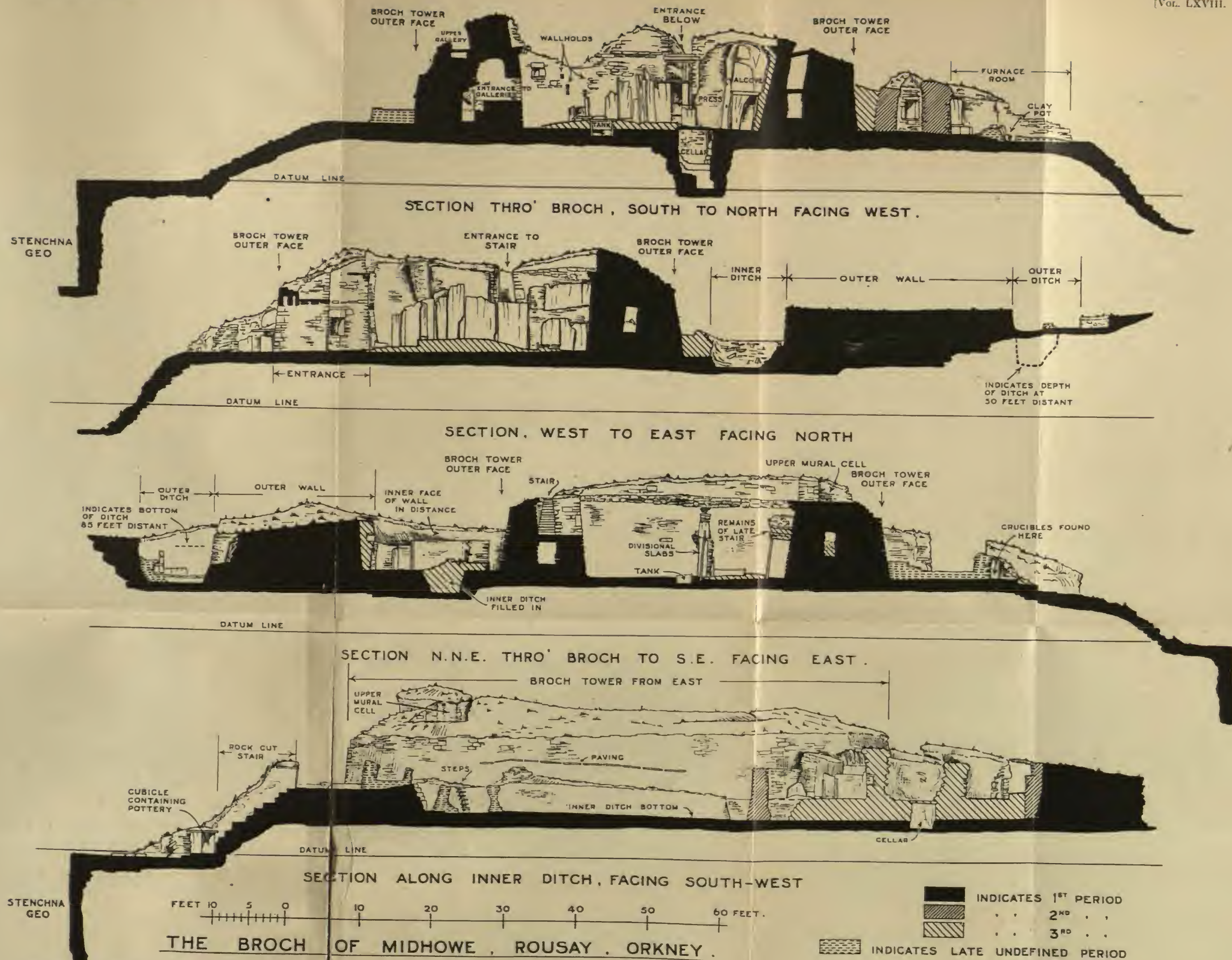
THE BROCH OF MIDHOWE, ROUSAY, ORKNEY.

J. GRAHAM CALLANDER and WALTER G. GRANT.

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PLATE VIII.

[To face page 511.]



(South Kensington), is very much larger; but characteristics such as the shape of the forehead and the set and trend of the horn-cores are very similar. The skull is associated with archaeological remains typical of the Broch Period, such as long-handled weaving combs, spindle whorls, hammer stones etc., and with other animal bones. The latter comprise an ox humerus, also small sized and sturdy (probably belonging to the same animal as the skull), the lower jaw of a seal, several pig's teeth, sheep and bird bones, and also the lower jaws of a dog which are in size and detailed measurements comparable with dogs' skulls of prehistoric date in the British Museum (actually specimen E 161., which



Fig. 56. Skull of the Midhowe Ox. *Bos frontosus*.

are the lower jaws of a dog from a Swiss Lake Dwelling). Judging from these facts, the animals present must have belonged to an age long past; an age when a culture was being formed in Orkney similar to that which was formed on the Continent in the Swiss Lake Dwelling Period. The particular ox in question may have been introduced at a previously early date from Scandinavia, and as a result of conditions different from those on the Continent from which it had been transported had, as time went on, diminished in size, as all island races tend to do, and yet still retained the characteristics of its root stock, the larger *Bos frontosus*, so widespread on the Continent in early times. This seems to be the first of its kind recorded from Great Britain.

REPORT ON BONES OF OX. By Professor JAMES RITCHIE, D.Sc.,
F.S.A.Scot., University of Aberdeen.

The single fragment of an ox skull shows that the skull had been cleft through the centre of the forehead, presumably for the extraction of the brain. In almost every respect the fragment resembles the

unique skull of a small sturdy type of ox, described also from a fragment recovered from Midhowe Broch, by Miss Margery Platt, M.Sc., as representing a Scandinavian wild ox, *Bos frontosus*, in one of its domesticated varieties.¹

The present fragment, which consists of the upper part of the forehead and top of the skull, with one horn-core, shows that the vertex of the frontals lay almost in line with the upper surface of the horn-cores. The angle at the vertex between the frontal and occipital regions is about 65°; the horn-core is oval in section, flattened slightly in a front and back direction, measuring 18.3 cms. in circumference at its base, but so abraded that its original length cannot be estimated. In one respect the fragment differs from that described by Miss Platt, namely that the breadth of the forehead, measured between the bases of the horn-cores (and estimated from the almost complete half) was approximately 21 cms. against the 13 cms. of Miss Platt's specimen, where possibly sufficient allowance has not been made for an intervening fracture.

With the skull is an axis or 1st cervical vertebra, which probably belonged to the same animal, and which shows marks of hacking with a metal implement.

Dr W. T. CALMAN, Keeper of Zoology, British Museum (Natural History), to whom the hard pieces of whale's bone and the tube formed from the leg-bone of a bird were submitted, states:

"(1) The pieces of dense bone which you not unnaturally supposed to be ivory were examined by Mr W. P. Pyecraft and found to be parts of one of the paddle bones of a very large whale. None of us had any idea that any parts of a whale's bone were so dense as these. Most of them are almost spongy in texture.

"(2) The bone pipe has been studied by Mr P. R. Lowe, who says 'it appears to consist of the middle portion of the ulna of some large bird, such as the wild goose, or, possibly, the fish eagle (*Haliaeetus*). The cortex and cancellous tissue have been almost entirely removed, either by natural decay or artificial means. The bone, in fact, has been so treated that practically all its characters have disappeared, and this makes it impossible to express any decided opinion as to the species of bird to which it belongs.'

¹ "Notes on the Skull of an Ancient Ox from Rousay, Orkney." M. I. Platt in *Scottish Naturalist*, 1933, p. 17.

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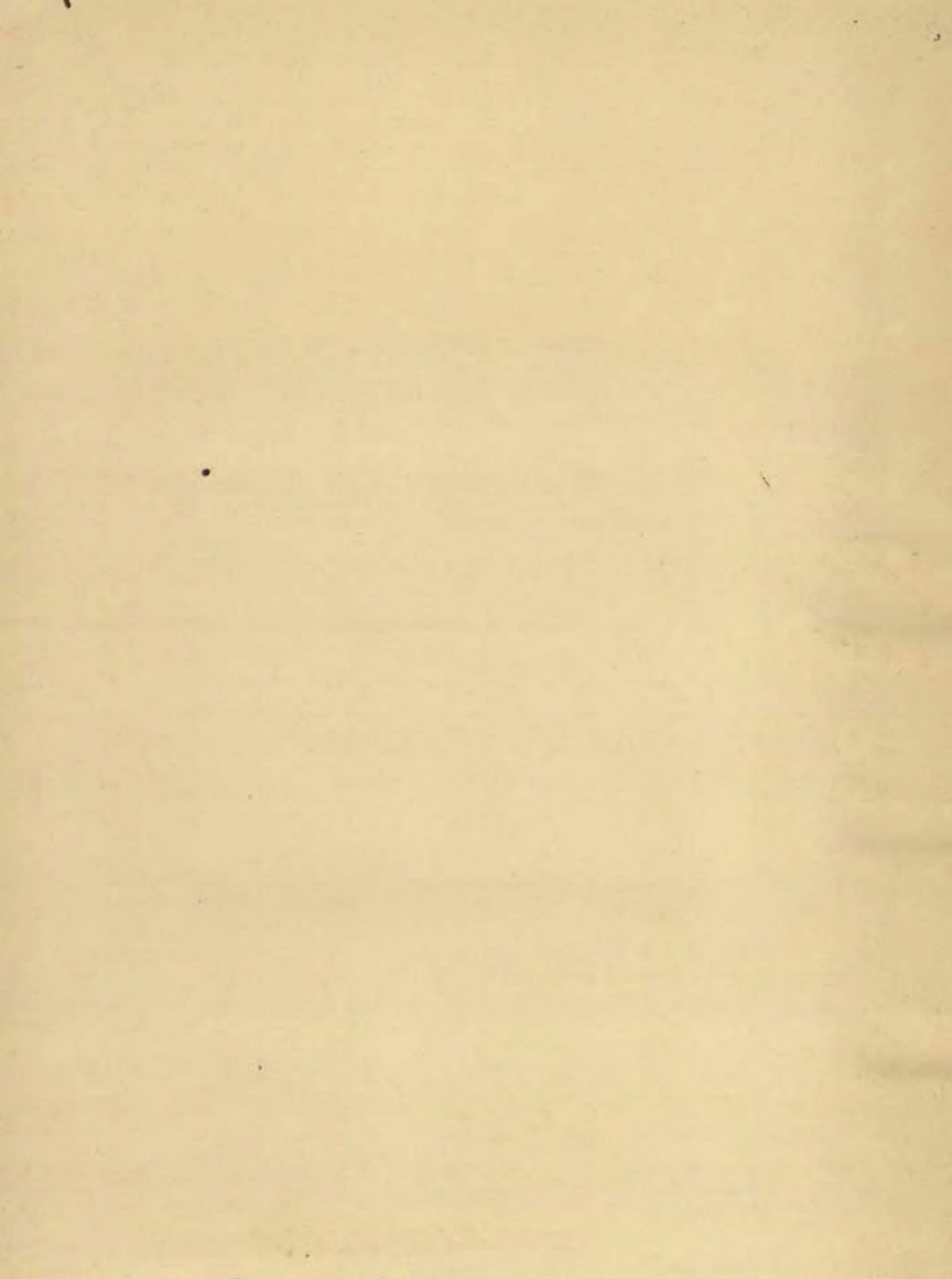
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